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Monopolistic Competition and General Equilibrium Theory

BY

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To
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PREFACE

THIS preface wishes to be, first of all, a tribute to Harvard, to the serene work of its seminars and libraries and to the stimulating atmosphere of friendship that unites professors and students in the never-ending quest. In the memory of those who have lived the Harvard life, the old Yard will always remain the dreamland of students and scholars. I cannot adequately express my appreciation to the C. R. B. Educational Foundation which gave me the opportunity of spending three full years at the Graduate School of Arts and Sciences.

This study was accepted in 1938 as a Ph.D. dissertation and filed in the Widener Library. Later changes were directed mainly at improving the presentation of an argument, at times unusually arid. My gratitude for the preparatory work must be addressed to all those to whom I owe my training in economics: to Professors P. van Zeeland and L. H. Dupriez at Louvain, J. D. Black, E. F. Gay, J. M. Cassels, etc., at Harvard, Henry Schultz and F. H. Knight at Chicago. Directly, however, three men are responsible for any good that may be found in this thesis: Professors J. A. Schumpeter, E. H. Chamberlin, and W. Leontief of Harvard University. Professor Leontief was the first with whom I discussed the problems to be investigated and the way in which they might be approached. I cannot overstress my indebtedness to him, as most of the present work evolved out of these preliminary, but fruitful and illuminating, discussions. While in the process of writing, I remained constantly in contact with him as well as with Professor Chamberlin, and both of them followed the manuscript as it evolved, chapter after chapter. Professor Chamberlin's criticisms were invaluable at this stage, as he kindly gave much time and attention to all the parts of the manuscript, and especially to those relating to the theories of imperfect or monopolistic competition. Most of the modifications and improvements

from the original to the present draft are due to his criticisms and suggestions. Professor Schumpeter, under whom I received my training in economic theory, is responsible for my interest in that branch of economic science. The whole manuscript has been submitted to him, and bears everywhere the mark of his influence.

At the University of Chicago, where I spent the summer of 1937 and some weeks in July 1938, I received much encouragement from the late Professor Schultz. Professor Oskar Lange also helped me with some useful suggestions, especially in connection with the graphical presentation of the theory of profit.

Dr. P. M. Sweezy of Harvard discussed at length with me the passages relating to the definition of pure monopoly. I must also mention my talks and discussions with those graduate students who contribute so much to the success of "Harvardian" research work. I remember with gratitude my fellow students of these three years, especially Mr. P. A. Samuelson and Mr. Shigeto Tsuru.

Last but not least, Professor A. P. Usher and Miss Lois Brandt went over the whole manuscript and did much to improve the English and remove innumerable errors. They deserve the gratitude of the reader as much as my own.

<div style="text-align: right">ROBERT TRIFFIN</div>

ELIOT HOUSE
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INTRODUCTION

THE theories of monopolistic and imperfect competition have
been with us now for seven years. An abundant crop of articles
has sprung up criticizing, endorsing and complementing the
original analyses of Mrs. Robinson and Professor Chamberlin.[1]
What is most needed at this juncture is not an additional paper,
discussing or amending some point of detail, but a general
restatement aiming at a clarification of the present position of
the theory, consolidating the progress made so far, and attempt-
ing to carry the whole subject on into new and uncharted
lands.

Something might be gained if we could approach the prob-
lem from a new angle and escape from the particular tradition
and methodology within which the discussion has proceeded
so far. A way of achieving this is clearly indicated. Monopolis-
tic and imperfect competition theories have been evolved in the
United States and in England alike along the lines of the theo-
retical tradition dominant in both countries: the particular
equilibrium economics of Alfred Marshall. What we might well
do now is to restate the whole problem in terms of the Wal-
rasian, general equilibrium system of economic theory, so
much more influential in economic thought on the continent of
Europe.

We shall find, with happy surprise, that monopolistic com-
petition begins to bridge the canyon which has for years
separated these two schools of theoretical thought. Indeed,
monopolistic competition theory will help us to get a clearer
understanding of the proper scope and significance of both.

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[1] Joan Robinson, *The Economics of Imperfect Competition* (London, 1933),
quoted later as "Robinson." E. H. Chamberlin, *The Theory of Monopolistic
Competition* (Harvard University Press, 1933), quoted later as "Chamberlin";
later editions include an exhaustive bibliography of the literature of the subject.

1. The Theory of the Economic Unit and the Theory of External Interdependence

As a first step toward our goal, let us consider briefly the nature of the content of economic theory. In both the Walrasian and Marshallian systems two very different types of propositions are to be found.

The first ones refer to the individual, and to his behavior in the economic field, both as a consumer and as a producer. His activity is discussed in terms that are purely subjective: it is presented as based on indifference functions expressing his tastes, on expectations as to the demand and cost of the product he turns out, etc.

The others refer to the actual interactions which develop, in fact, on the markets, as a consequence of these anarchistic decisions of our economic units. Individual expectations on which the decisions were based may be confirmed or contradicted by actual market phenomena. A state of equilibrium is reached, when the independent decisions of households and firms are found to be compatible with one another and to force no further revisions in individual expectations and behaviors.[2]

Such a distinction between a *theory of the economic unit* and a *theory of external interdependence* appears to be fundamental. Its explicit introduction into current statements of theory would pave the way for a process of unification and generalization that would greatly simplify the exposition and better reveal its real meaning and content. While the whole theory of the economic unit (firm or household) can be derived from a single principle of subjective maximization of some sort, the theory of the interdependence of the economic units necessitates a wider range of hypotheses, only vaguely classified as yet under the names of monopoly (monopsony), duopoly, oligopoly, and pure, perfect, monopolistic and imperfect competition. To achieve a more systematic and unified treatment of the various

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[2] Cf. W. Leontief, "The Significance of Marxian Economics for Present-day Economic Theory," *American Economic Review*, Supplement, xxviii (1938), 1–9.

modes of firms' interdependence will be one of our tasks in the following pages.

2. Monopolistic Competition and the Theory of the Economic Unit

Indicative of the confusion still reigning with respect to such vital concepts is the fact that most theorists seek their criteria of monopoly and competition not in the relationships *between* the potential competitors, but in some characteristics relating to the individual firm, taken in isolation: the slope, let us say, of its sales curve.[3] For most of Professor Chamberlin's and Mrs. Robinson's readers, this is the basic distinction between monopolistic (or imperfect), and pure (or perfect) competition. If the sales curve of the firm is perfectly elastic, we are confronted with pure competition. If, on the contrary, the curve is tipped, competition is taken to be monopolistic or imperfect.[4]

In line with such an interpretation, the very wide recognition already granted to monopolistic competition in the literature is almost exclusively directed toward that part of the theory that relates to the first category mentioned above, *i.e.*, the maximizing behavior of the economic unit. The substitution of the equation of marginal cost and marginal revenue for the less general and less elegant equation of marginal cost and price has been the main contribution of monopolistic competition theories to the "pure economics" of our textbooks. This

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[3] I have found it convenient to use, throughout this study, the term *sales curve* in place of the cumbersome expression *demand curve for the firm's product*. The *producer's demand curve* might be confusing and interpreted as referring to his purchases rather than to his sales.

[4] Cf. R. F. Kahn, "Some Notes on Ideal Output," *Economic Journal*, xlv (1935), 20: "Competition is imperfect if . . . the demand for the individual firm is not perfectly elastic. The elasticity of demand for the individual firm can be employed as an inverse ordinal measure of the *degree* of imperfection of competition." Cf. in the same sense N. Kaldor, "Professor Chamberlin on Monopolistic and Imperfect Competition," *Quarterly Journal of Economics*, lii (1938), 515 and 526; also J. R. Hicks, "Annual Survey of Economic Theory: the Theory of Monopoly," *Econometrica*, iii (1935), 1–20; Mrs. Robinson had taken substantially this position in "What is Perfect Competition?" *Quarterly Journal of Economics*, xlix (1934), 104–120. Professor Chamberlin, however, never advocated it explicitly; his introduction of oligopoly into the debate breaks the simple dichotomy between perfectly and imperfectly elastic demand.

being done, most authors rush to the political consequences they want to draw from the new theories, or insist at length on some of their institutional aspects.

And yet, for pure theory (as opposed to descriptions of its present institutional setup) these aspects of monopolistic competition bring very little that is new. Technically, monopolistic competition is only applying to a wider field and developing with a greater elegance, methods of analysis which, in their essentials, are already to be found not only in Cournot and Pareto, but also in the whole Marshallian tradition.[5] Cournot's solution of monopoly, accepted and transmitted without substantial changes by Marshall and Pareto, already contains all the modern analysis of the "equilibrium of the firm." It will be remembered that, in opposition to Marshall and Pareto, Cournot himself even adopted this monopoly solution as a general starting point for all the cases discussed, building up from monopoly to limited and, finally, to unlimited (pure) competition.[6] This procedure had to be rediscovered independently, a century later, by Mr. Sraffa and the Cambridge School.[7]

3. MONOPOLISTIC COMPETITION AND THE THEORY OF EXTERNAL INTERDEPENDENCE

Indeed, little progress could be expected with respect to the development of the implications contained in the single profit-maximization equation which supports the whole analysis of the firm's behavior. The main issue was whether to consider price as a parameter or as a variable. The adoption of the latter term of the alternative had already been made familiar by the

[5] Cf. E. H. Chamberlin, "Monopolistic or Imperfect Competition?" *Quarterly Journal of Economics*, LI (1937), 558–560.

[6] Augustin Cournot, *Recherches into the Mathematical Principles of the Theory of Wealth* (Paris, 1838), English translation by N. Bacon (New York, 1897); quoted below as "Cournot."

[7] Piero Sraffa, "The Laws of Returns under Competitive Conditions," *Economic Journal*, XXXVI (1926), 535. Mrs. Robinson took her lead from Mr. Sraffa's article. Cf. Robinson, 4: "Now no sooner had Mr. Sraffa released the analysis of monopoly from its uncomfortable pen in a chapter in the middle of the book than it immediately swallowed up the competitive analysis without the smallest effort. The whole scheme of analysis, composed of just the same elements as before, could now be arranged in a perfectly uniform manner. . . ."

traditional theory of monopoly. In this field, the main contribution of monopolistic competition should be seen in the Chamberlinian discussion of selling costs and of product variation as further variables to be taken into account, side by side with price, in the search for maximum profits.

The distinguishing feature of monopolistic competition, however, lies in another direction which takes us away from the theory of the economic unit into the theory of external interdependence. According to Professor Chamberlin, the originality of monopolistic competition theories lies in the fact that, monopoly being taken "as a starting point," attention is then directed toward "the adjustment of economic forces within a group of competing monopolists, ordinarily regarded merely as a group of competitors." [8] It is in this field, the second part of our economic theory, that we must look for the real contribution of monopolistic competition writers to modern value theory.

The appraisal of this contribution, however, will vary widely according to our frame of reference. While in perfect concordance when analyzing the individual firm's behavior, the Marshallian theory of particular equilibrium and the continental theory of general equilibrium diverge sharply when treating problems external to the firm. Thus, we shall have to distinguish here between the contribution of monopolistic competition to the theory of particular equilibrium on the one hand, and on the other, to the general equilibrium theory of Walras and Pareto.

If we look for the gravitational center of the Marshallian system of economics, it will be found to be not the firm but the industry, vaguely defined with reference to an undifferentiated commodity, in the every day use of the term. The English tradition has consistently emphasized the "industry" as the unit best suited for economic analysis. It is in connection with the industry, with the price and output of its undifferentiated product, that the old concepts of supply and demand were forged and were made to yield a theory of market price and

[8] Chamberlin, pp. 68 and 69.

of normal price. The firm was not entirely ignored, but it is significant that attention was given to it almost exclusively in the chapters on monopoly, *i.e.*, precisely in those cases where the firm is not distinct from the industry itself. A notable exception is to be found in note XIV of the Mathematical Appendix of Marshall's *Principles*.[9] But even with Marshall, this remains an exception; in the text itself, as distinct from the appendix, Marshall, in order to elucidate the problem of the firm, relies mostly on parables about trees and forests and on that hazy construction of his: the "representative firm." On the whole, the "industry" delineates for Marshall both the outer and inner boundaries of the analysis.

Faithful to particular equilibrium methods, monopolistic competition writers respected the outer boundary and did not venture into the no man's land of "inter-industry" economics. But the inner boundary was definitely abolished and the problems of the industry were intimately related to the behavior of the individual firms composing it. Such an extension of the analysis is distinctly post-Marshallian: Marshall's occasional remarks about the firm's behavior are nowhere integrated into the main trend of an analysis, narrowly clustered around "industrial" concepts. Its appearance may be dated from the now famous *Economic Journal* controversy on increasing returns.[10] The de-

[9] A. Marshall, *Principles of Economics* (8th edition, London, 1920), quoted later as "Marshall", pp. 846–852, especially pp. 849–850, also pp. 457–459; in these passages where the individual firm is discussed it is significant that Marshall is driven toward monopolistic competition assumptions: a *particular* demand curve for the firm (as against "the general demand curve for its commodity in a wide market"), a degree of control over price. But these phenomena are then labelled "problems . . . relating to short periods" and discarded from the *Principles*, "to be analysed separately in special discussions" (p. 849).

[10] The discussion developed mainly from 1926 to 1933; cf. Piero Sraffa, "The Laws of Returns under Competitive Conditions," *Economic Journal*, XXXVI (1926), 535–550; A. C. Pigou, "The Laws of Diminishing and Increasing Cost," *E. J.*, XXXVII (1927), 188–197; A. C. Pigou, "An Analysis of Supply," *E. J.*, XXXVIII (1928), 238–257; G. F. Shove, "Varying Costs and Marginal Net Products," *E. J.*, XXXVIII (1928), 258–266; J. A. Schumpeter, "The Instability of Capitalism," *E. J.*, XXXVIII (1928), 361–386; Lionel Robbins, "The Representative Firm," *E. J.*, XXXVIII (1928), 387–404; Allyn Young, "Increasing Returns and Economic Progress," *E. J.*, XXXVIII (1928), 527–542; D. H. Robertson, G. F. Shove, P. Sraffa, "Increasing Returns and the Representative Firm: A Symposium," *E. J.*, XL (1930), 79–93; R. F. Harrod, "Notes on Supply," *E. J.*,

bate was brought to an end by the appearance [11] of the theories of monopolistic and imperfect competition. The emphasis on the firm as against the industry and the study of the price-and-output problems of the individual producer were, from the start, a dominant characteristic of the new approach, instilling a sense of concreteness to its theory of value. The modifications introduced by Pigou in the third edition of his *Economics of Welfare* (1929),[12] are significant of this change.

With monopolistic competition, not only the firm's behavior is systematically integrated into the analysis, but, more important, the emphasis is shifted definitely from the *industry* toward the *firm*. For Anglo-Saxon economics, the step is one of importance and leads immediately toward an analysis much closer to general equilibrium methodology than ever before. For, if the firm, rather than the industry, is taken as the basic unit, there arise, as in general equilibrium theory, conditions of equilibrium *external* to the firm. Consideration of the general interdependence of the economic system is, however, still limited by the new theorists to the group or industry, rather than extended, as in Walrasian economics, to the whole economic collectivity.

In opposition to Anglo-Saxon economics, the French tradition, in its presentation of the workings of economic equilibrium, had always starred the firm rather than the industry. As has been mentioned already, Cournot develops his whole analysis from the concrete consideration of the firm's behavior. In

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XL (1930), 232–241; R. F. Harrod, "The Law of Decreasing Costs," *E. J.*, XLI (1931), 566–576; J. Robinson, "Imperfect Competition and Falling Supply Price," *E. J.*, XLII (1932), 544–554; A. C. Pigou, G. F. Shove, J. Robinson, "The Imperfection of the Market," *E. J.*, XLIII (1933), 108–125; cf. also the earlier discussion by F. H. Knight in "Cost of Production and Price over Long and Short Periods," *Journal of Political Economy*, XXIX (1921), 304–335; "Some Fallacies in the Interpretation of Social Cost," *Quarterly Journal of Economics*, XXXVIII (1924), 582–606; both articles reprinted in F. H. Knight, *The Ethics of Competition* (New York, 1935).

[11] Most of Professor Chamberlin's book was written at a much earlier date, being filed as a doctor's thesis in Widener Library in 1927; cf. Chamberlin, p. vii.

[12] Cf. Chapter XI of Part II, pp. 215–219, and the addition of the first five sections of Appendix III, pp. 787–806.

Walras and Pareto, the whole system of general equilibrium is made explicitly to hinge upon the individual entrepreneur and his efforts to maximize profits. While this underlies also all the Anglo-Saxon statements of value theory, it is not as fully developed and reliance is often placed on more general, or even merely implicit, treatments of entrepreneurial behavior. It is significant, for instance, that in Marshall's *Principles* the ultimate components of the supply curve (the quantities marketed by each of the firms composing the industry) remain in the background and that their relation to the curve is taken as a matter of course.

With respect to the firm's position in the analysis, general equilibrium theory had thus very little to learn from monopolistic competition teachings. As for the "industry" or "group," it could only appear to general equilibrium theorists as a far too timid substitute for a fuller recognition of the generality of economic interdependence throughout the system, permeating all the "industries" composing the collectivity as well as all the firms composing any one of these industries.

The general equilibrium approach, however, was from the start and remains to this very day, dominated by the purely competitive assumptions of the Walrasian system. True enough, Pareto and his followers discuss, and pretend to have covered in their analysis, the monopoly case which monopolistic competition writers want to see emphasized as the only valid model for large sectors of our economic world. Under the heading "Monopoly of two individuals and of two commodities" Pareto even seems to have treated, and found determinate, the characteristic problem of monopolistic competition, *i.e.*, the case of several competing monopolists (in the traditional sense of the latter term). We shall find later that the problem is really evaded and that the omission of a satisfactory discussion of this case vitiates the whole analysis of general equilibrium, in so far as it aims to include among its assumptions monopoly as well as pure competition. When establishing this point, I shall contend that the limitation of monopolistic assumptions by some device adapted from Professor Chamberlin's "large group"

case, is an essential prerequisite for a valid development of pure economic analysis of the general equilibrium type. If this be true, the isolation of the "large group" case will appear as a definite and most essential contribution of monopolistic competition to general equilibrium theory.

Aside from this, monopolistic competition analyses should also exert their influence in clarifying some of the more obscure and unsatisfactory parts of the traditional statements of general equilibrium. The equation of marginal cost and price, for instance, and also the theorems based on the search for absolute minimum unit cost by the producer have, for a long time, been a source of confusion and controversy. Difficulties were found in reconciling the first with this other equilibrium requirement: the equation of unit cost and unit price.[13] As for the second point (one of the essential components of Walras's marginal productivity theory), it is enough to mention the wearisome controversy to which it gave birth and which, for half a century, has been responsible for the interest shown by economists in that awe-inspiring piece of their apparatus: Euler's theorem about homogeneous functions.[14]

In both cases, the trouble started with an unhappy formulation of equilibrium requirements, substituting complex results, derived from special hypotheses (pure competition, absence of

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[13] Cf. W. Zawadski, _Les Mathématiques Appliquées à l'Economie Politique_ (Paris, 1914), pp. 212–213; and Henry Schultz, "Marginal Productivity and the General Pricing Process," _Journal of Political Economy_, xxxvii (1929), 505–551.

[14] Although in disagreement with one another, both Wicksteed and Walras remained dissatisfied with their own solution of the problem. Cf. Philip Wicksteed, _The Co-ordination of the Laws of Distribution_ (London, 1894), reprinted in 1932 in the London School of Economics Series of Reprints), and _The Common Sense of Political Economy_, p. 373; Léon Walras, _Eléments d'Economie Politique Pure_ (Appendix on Wicksteed's theory of rent, to be found only in the third edition, 1896; cf., in the 1926 edition, p. 376, n. 1); Knut Wicksell, _Lectures on Political Economy_ (1901; Robbins edition, London, 1934), I, 124–133; J. R. Hicks, _The Theory of Wages_ (London, 1932), pp. 233–239; Joan Robinson, "Euler's Theorem and the Problem of Distribution," _Economic Journal_, xliv (1934), 398 ff.; E. H. Chamberlin, "Monopolistic Competition and the Productivity Theory of Distribution," _Explorations in Economics, Essays in Honor of F. W. Taussig_ (New York, 1936), and "Monopolistic or Imperfect Competition?" _Quarterly Journal of Economics_, li (1937), 577–580; P. A. Samuelson, "A Comprehensive Restatement of the Theory of Cost and Production" _(unpublished)_; H. Schultz, article cited in footnote 13.

profits), for the fundamental, elementary equilibrium conditions of equation of marginal cost and marginal revenue, minimization of total cost relative to output, and stability in the number of producers.[15] Re-examination of these points will introduce into the general equilibrium solution a greater generality and elegance, while at the same time recognizing explicitly the variety and richness of the concrete cases to be fitted into the theoretical pattern.

4. PLAN OF THE BOOK

The previous pages have referred to the lifelong cleavage in our theory of value between the Lausanne presentation of general equilibrium and the Marshallian tradition of particular equilibrium economics. The rise of monopolistic competition theory should mark a first step toward the integration of these two branches of our economic methodology and the unification of modern value theory.

The transition is already effected by the shift of emphasis, in Anglo-Saxon economics, from the industry to the firm, and by the corollary of such a change: a fuller study of the importance of the economics of external interdependence. As long as the "industry" remained the fundamental unit of economic analysis, the problem of equilibrium *within* that unit assumed an importance that could explain the quasi-exclusive attention devoted to it by the theorists of particular equilibrium. With, however, the breaking up of the industry into firms, the old problem of equilibrium within a relatively large economic unit fades into the background before the now all-important problem of the relationships *between* relatively small economic units. The attention passes from the equilibrium of supply and demand within an industry to the conditions of equilibrium external to the firm. By virtue of definition, the latter question cannot be successfully attacked with the tools of particular equilibrium, forged as they are for the study of one economic unit (the industry yesterday, now the individual firm) in isolation from the rest of the system.

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[15] Involving or not the absence of ("supernormal" or "subnormal") profits.

It will be the main task of our first chapter to compare the two approaches and to blend into a unified whole the general equilibrium theory of value and the more modern expression of the Anglo-Saxon tradition: the theories of monopolistic competition. The latter are still too recent to have reached the crystallization point where individual expositions are merged into a common body of thought. Vital divergencies between various writers make it imperative that we review the present stage of the discussion. As to the position of general equilibrium with respect to monopolistic competition, a terminological confusion needs first to be dispelled between Mrs. Robinson's "imperfect competition" on the one hand, and on the other, Pietri-Tonelli's "imperfect competition," identical in content with Pareto's "incomplete competition." The similarity, however, is purely superficial, the latter concepts arising, surprisingly enough, in connection not with decreasing, but with increasing, marginal costs. Both Pareto and Pietri-Tonelli are badly muddled on this point: a note appended to Chapter I will try to restate the case in a more intelligible way and to clear up some minor mistakes in exposition. For a comparison of monopolistic competition and general equilibrium, we thus have to look toward a different part of the Paretian system. The Paretian parallel for monopolistic competition should be looked for not under the label of "incomplete competition," but rather in the traditional monopoly case, as it appears in the context of general equilibrium economics. I shall try to substantiate this contention in the last section of Chapter I.

Chapter II undertakes a critical examination of the general body of doctrine expounded in Chapter I. The main deficiencies of monopolistic competition theories in their present stage are discussed. Most of all, the difficulties surrounding the definitions of groups, industries, commodities, are emphasized. It is held that a concept of group, or industry, has no place in the general *a priori* stage of the theory of value; strictly speaking, it is even incompatible with monopolistic competition, and its survival from the wreckage of purely competitive assumptions serves only to provide a simplified, but purely conventional,

solution for the now dominant problem of inter-firm competition.

The abandoning of the group implies also the abandoning of the correlative notion of a commodity, as traditionally defined. Chapter II closes with an attempt to supply us with a precise, unambiguous definition of the elementary units — the commodity, the firm, — upon which our analysis will be laid.

Starting from new definitions of commodities and factors, free from the objections previously encountered, we proceed, in Chapter III, to outline the contours of a theory of external interdependence. The recognition that a criterion for monopoly and competition should be based, not on any characteristic pertaining to the situation of the individual firm (such as the slope of its sales curve), but on the competitive relationships *between* the firms leads to a new classification, more precise and systematic, of interdependence between firms, with pure monopoly and monopsony at the one pole, and pure competition at the other. The degree of control of the seller over price (the slope of the sales curve) is undoubtedly an important factor, of which the significance is evident; but more important, its inadequacy should be recognized as a criterion of monopoly and competition. New and stricter definitions will be presented: with the disappearance of the group, the definitions of oligopoly and monopoly will have to be divorced from questions of numbers; as for pure competition, its definition will be shown to reside neither in the horizontality of the sales curve, nor in the similarity of the competing commodities, nor even in the identity of their prices.

The shape of the cost curve has been closely linked by some theorists [16] with the issue: monopolistic as against pure competition. These claims are examined in Chapter IV and, as a result, a more thorough investigation of pure competition is launched, in which account is taken of the vital importance

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[16] The historical connection (between decreasing costs and imperfect competition) is not in question, but the logical link between the imperfection of the market and indivisibilities of cost; cf. N. Kaldor, "Professor Chamberlin on Monopolistic and Imperfect Competition," *Quarterly Journal of Economics,* LII (1938), 513–529, especially 520–522.

of rising marginal cost for the definition of a horizontal sales curve.

Chapter V brings us back to the main trend of the argument and extends to questions of profit and entrance into the industry, the theory of external interdependence introduced in Chapter III. The current use of the concept of entry will be exposed as an empty convention, taking the place of a concrete investigation of the problem of profit, and obscuring some of the most significant aspects of the workings of a free economy.

Some of the results attained in these chapters, by laying bare the implications of the specific methods of pure economics, have a direct bearing on the more general problem of the relation of pure theory to social policies. The pure economics of competition, monopoly, entrepreneurship, etc. . . . must be dissociated from the political and ethical connotations they still carry for many a theorist (see, *e.g.*, the innumerable comparisons between perfect and imperfect competition, or the distinction of economic and institutional monopolies by Mr. Kaldor). The "ethical neutrality" of pure economics is illustrated at the close of Chapter V by a discussion of the real content of the doctrines linking pure competition or free entry with the absence of profit.

The appearance of monopolistic competition assumptions has been a new step in the historical process of purification and formalization of economic theory. The analysis loses in content, while gaining in generality. The sales curve of the firm, *e.g.*, is no longer considered perfectly elastic: it may assume any and every degree of elasticity. A clear understanding of this evolution helps us to recognize the respective claims and domains of both "institutional" and "theoretical" economics. It is hoped that our analysis may contribute to such an "appeasement" by making our theory of value logically more satisfactory, while at the same time emphasizing the need for factual investigations in the choice of our assumptions. Empirical research should take the place of the conventional notions often presented as answers to our questions in the stage of general theorizing (such as the concepts of free, closed, restricted

entry); it should fill up some of the famous empty boxes of Dr. Clapham.

On the other hand, we shall find that an increasing number of situations elude the grip of the traditional weapons of pure economics. This raises the question whether we should not, reversing the historical process of growing generalization just mentioned, enlarge the present box of assumptions of pure theory so as to enable us to tackle these cases; again, the required assumptions should be chosen on an empirical basis, and a price will have to be paid in the form of a lesser generality for the ensuing analysis.

CHAPTER I

THE PRESENT STAGE OF MONOPOLISTIC COMPETITION THEORIES

For the historian of economic thought, the most revolutionary feature of monopolistic competition theories will probably be the unprecedented pace at which they conquered their audience. The textbook consecration of an economic doctrine used to be a posthumous ceremony, performed when scientific interest in that doctrine had died or was at least dying.[1] In the case of monopolistic competition, however, five years had not elapsed before textbooks were revised, one after another, in order to insert one or two chapters on the new theory.

This rapid triumph capitalized on the general dissatisfaction with the traditional theory of competition in a world whose economic life presented a permanent challenge to competitive analysis. Pure competition was irreconcilable with increasing returns, with control over price, with advertising, etc. . . . . Now there arose a theory in which all these facts found their place, and were systematically integrated into the analysis of value phenomena. Could it but be welcomed by any economist interested in the actual world in which he lives?

On the other hand, the theory of pure competition had often been seized upon, in popular expositions at least, as a "scientific" weapon against all interventionists, in support of a hands off policy on the part of governments. Most of those who refused to bow to the *laissez-faire* injunction were still sufficiently impressed by the economic arguments behind it to think it necessary to turn their backs upon economic theorizing as a whole and to take refuge in some vague "institutional" or "empirical"

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[1] A crying example of this is the shameful neglect shown by economic teaching for the work of Léon Walras. A recent and most popular text on the history of economic thought goes as far as not even to mention his name.

tendency, very much looked down upon by their orthodox colleagues. In monopolistic competition, they saw their chance to vindicate themselves and to reconcile their political attitudes with the prestige of theoretical "soundness."

These two factors seem to me to have been the more influential ones in winning to the new doctrines such a sweeping popularity with the economic public at large. The love is for the assumptions and the conclusions; as for the deductive apparatus linking the former with the latter, infatuation would in most cases be a better word. Indeed, there seems to be little grasp of the exact theoretical structure of the new analyses: significant divergencies between the main expositions are ignored and all of these bundled together for uncritical acceptance or rejection.

Before embarking upon any comparison of monopolistic competition and Paretian economics, it will be imperative that we restate as concisely as possible the contributions of the three leading exponents of the new theories and discuss their methods and their most glaring deficiencies. This discussion will be confined to the problems of theoretical deduction and techniques. Moreover, we shall limit ourselves to those parts of the theories that study the problem of value (as against all problems in distribution) under "monopolistic" or "imperfect" assumptions. We shall discuss in this chapter neither monopoly nor pure competition.[2]

Finally, this analysis of Chamberlin, Robinson and Stackelberg aims, not at a restatement of these writers' position for its own sake, but at a comparison of their techniques and results with a view to the positive developments in our later chapters. This justifies the relative attention devoted to each of them and especially the scanty treatment given to *The Economics of Imperfect Competition* as compared with *The Theory of Monopolistic Competition*. Mrs. Robinson dismisses in a few words the difficulties which it is our main task to unveil and discuss. Professor Chamberlin goes into them more deeply and his setting of the problem is free from the obscurities and

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[2] Cf. below, Chapters III and IV.

ambiguities that mar *The Economics of Imperfect Competition*.[3]

1. Professor Chamberlin's Theory of Monopolistic Competition

A. GENERAL CONDITIONS OF EQUILIBRIUM

In its inheritance from Marshallian ancestry, monopolistic competition found, first of all, the demarcation of the boundaries within which its analysis was to move. The economic world had been divided by Marshall into a number of industries, each of which corresponded roughly to one of the commodities bought and sold on the market. Following Marshall's "statical method," an industry was isolated from the rest of the system and the quantities of the commodity demanded and supplied were related unequivocally to its market price, all other conditions (and especially the prices of all other commodities) being provisionally assumed constant. Equilibrium conditions were defined by the attainment of the normal price, *i.e.*, the price for which the quantity demanded and the quantity supplied would be equal.

Once introduced, however, the "provisional" statical assumptions of Marshall were never released within the realm of pure economics of the equilibrium type. "The statical treatment alone can give us definiteness and precision of thought. . . ."[4] When the statical assumptions (equivalent here to particular equilibrium methodology) are abandoned, the precise tools of equilibrium economics are discarded in favor of a "more philosophic treatment of society as an organism."[4] And so, for Marshall, equilibrium economics does not discuss

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[3] Cf. H. von Stackelberg, "Neues Schrifttum über unvollständigen Wettbewerb," *Schmollers Jahrbuch*, LIX (1935), 703–709, and especially 707–708: "Gegenüber Chamberlins straffer Linienführung sind die 'Economics of Imperfect Competition' viel loser aufgebaut. . . . Fragt man sich, welcher der heiden verwandten Arbeiten man den Vorzug gibt, so wird man sich für Chamberlins Werk entscheiden müssen. Es ist straffer, klarer, exacter und dringt tiefer in das Prohlem ein, während Rohinsons Buch zu sehr eine 'box of tools' ist und . . . nur teilweise das eigentliche Thema der beschränkten Konkurrenz zum Gegenstande hat."

[4] Marshall, p. 461.

the problem of competition between various industries; its task is over when it has inquired into the conditions of equilibrium for one industry, in isolation from the rest of the system.

Particular equilibrium methodology was carried over into the monopolistic competition treatment of value theory. The problem of equilibrium, characteristic of pure economics, was thus confined to the establishment of equilibrium within one "industry" or group of firms producing the same commodity.[5]

The solution is reached in two stages. First, each individual firm in the group must be in equilibrium, producing at a certain price a certain amount just equal to what its patrons are willing to take at that price. Then each firm being in equilibrium, further expansion or contraction of the industry's production depends only upon variations in the number of firms in the group. The group's equilibrium will thus be assured if, secondly, there is no tendency for the number of firms to vary.

✓1. *The Equilibrium of the Firm*

The whole behavior of the producer is assumed to be directed toward the maximization of his monetary profit, *i.e.*, of the positive difference between his revenue and his costs. The analysis leaves the time element entirely aside and proceeds on the assumption that, through costs and revenue, profits are unequivocally related to the firm's output. That is, corresponding to each level of output (x), there exists a minimum total cost $C(x)$ and a maximum total revenue $R(x)$, the difference between which constitutes the firm's profit $\pi(x)$.

The firm chooses the level of output that maximizes $\pi = R(x) - C(x)$. Putting the first derivative of π with relation to x equal to 0, we get the necessary condition

$$\frac{\delta\pi}{\delta x} = \frac{\delta R}{\delta x} - \frac{\delta C}{\delta x} = 0, \text{ or } \frac{\delta R}{\delta x} = \frac{\delta C}{\delta x}$$

or marginal revenue = marginal cost.

[5] The recognition that the products of the various firms within the same industry may be somewhat "different" is at the root of the theory of monopolis-

This expresses the necessary condition for the equilibrium of the individual firm.[6] The assumptions made so far (profit-maximizing behavior, sales and cost schedules invariant with relation to time and exactly known to the firm) are common to most economic theorizing and may be considered the minimum equipment of statical pure economics.

2. *The Equilibrium of the Industry*

Each firm within the industry having reached its optimum level of output, the whole group will be in equilibrium if, in addition, its production does not tend to expand or contract through the addition or withdrawal of firms to, or from, the group.

(1) The problem could of course be disposed of by supposing *the group to be closed*, *i.e.*, by denying the possibility for any firm to enter or leave the industry.

(2) *The group may be open*, or, in more familiar terms,[7] *entry may be free*, *i.e.*, it may be possible for firms to leave or enter

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tic competition proper. The difficulties in reconciling product differentiation with the concept of a group or industry will be taken up later: cf. Chapter II, 3, pp. 78–89.

[6] I have taken up here only one of the three equilibrium conditions formulated by Professor Chamberlin. In his analysis, profits are related not only to output, but also to product variation and to selling expenditure. The method of solution, however, is essentially the same, the three conditions of equilibrium becoming respectively

$$\frac{\delta\pi}{\delta x} = 0, \qquad \frac{\delta\pi}{\delta q} = 0, \qquad \frac{\delta\pi}{\delta s} = 0,$$

if q be taken to represent the variety of product, and s the selling expenditure. The solution may further be broadened by considering various modes of product variation. The condition for equilibrium is that the firm be unable to increase its profits by changing any of the variables under its command.

For simplicity, I shall, in the first three chapters, confine my attention to the problem of the firm's output. The problems of product variation and of selling outlays will be more appropriately treated in Chapter V, in connection with the question of entry. This provisional neglect must be borne in mind, when comparing *The Theory of Monopolistic Competition* with the expositions of Mrs. Robinson, von Stackelberg and Pareto, where no attention is given to these problems.

[7] In *The Theory of Monopolistic Competition* (as distinct from more recent articles) the assumptions as to entry are never explicit. The problem of entry is mixed up with a different issue: the presence or absence of oligopoly elements. My exposition makes explicit the assumptions about entry which are implicit in the various conditions of equilibrium derived by Professor Chamberlin.

the group and to compete on equal terms with the firms already in business. The free entry case is solved by assuming that additional firms will be tempted in so long as the firms in business make profits (in excess of the minimum necessary to attract unspecialized capital and business ability into the field) and that actual losses would drive firms out of the industry.[8] Thus stability in the number of producers can be reached, and can only be reached, if total costs are equal to total revenue for the firms in the group, which may be written

$$R = C.$$

(3) The *closed entry* assumption, as it appears in Professor Chamberlin [9] is a cocktail mixed from the two simple cases just defined: the group is closed so far as entry of firms is concerned, so that equilibrium is compatible with any amount of positive profits; but, the group is open in so far as exit of firms is concerned, so that equilibrium requires that the firms in the group make at least enough money to cover their costs, *i.e.*,

$$R \geqq C.$$

The apparent unrealism of the assumption that firms might be prevented from stopping production entirely, probably explains the preference for the closed entry over the more drastic assumptions of the closed group. The case, however, is not absurd, since other considerations might induce the firm to continue its operations at a level that minimizes losses (the zero level being excluded): examples might be found among governmental agencies, such as state-operated postal and transportation systems.

(4) The recognition of "the diversity of conditions surrounding each producer" within the group merely resolves itself into a combination of the two elementary assumptions of closed and free entry: "In so far as profits are higher than the general competitive level in the field as a whole or in any portion of it, new competitors will, *if possible*, invade the field and reduce

[8] Chamberlin, pp. 84–85.
[9] Chamberlin, p. 111.

them. If this were always possible . . . the curves would always be tangent and monopoly profits would be eliminated. In fact it is only partially possible. As a result, some (or all) of the curves may lie at various distances to the right of the point of tangency, leaving monopoly profits scattered throughout the group — and throughout the price system." [10]

To summarize, full equilibrium may be defined by the following set of conditions: (1) marginal revenue equals marginal cost, which may be written $R' = C'$, and (2) either (a) total revenue equals total cost, which may be written $R = C$; or, alternatively, (b) entry is closed and $R \geqq C$. This general discussion gives the key to an understanding of the whole Chamberlinian analysis and of the exact relation of its conclusions to the hypotheses made. It is significant to remark that the outline above applies equally to monopolistic competition and (with the possible exception of the passages about closed entry) to the special, limiting case, called pure competition. Indeed this latter distinction has not even appeared once in our presentation.

B. PARTICULARIZING ASSUMPTIONS AND DIAGRAMMATICAL TOOLS

I have attempted, in what precedes, to uncover the inner structure of Professor Chamberlin's argument. When expressed in general terms, his conclusions may be carried back to a simple combination of the assumptions described above, *i.e.*, profit maximization on the one hand, and on the other, either closed or free entry.

This bare outline is enriched by a most ingenious set of graphical illustrations which picture vividly to the reader the actual workings of the equilibrating process. To make this possible, however, attention has to be focussed on a concrete case more completely described than by the incompressible set of assumptions used in the general, abstract reasoning. I have thought it illuminating to distinguish clearly, in Professor Chamberlin's exposition, between the general definition of

[10] Chamberlin, p. 113.

equilibrium conditions and the particularizing assumptions underlying the graphical illustrations.

These particularizing assumptions fall in two groups: the first ensures the invariability of the cost curve throughout the argument, isolating for consideration the problems of demand and of competition in the selling market; the second, and most important, group of assumptions (the so-called "symmetry assumptions") posit a complete similarity between the firms in the group and thus allow us to picture through any single firm the adaptation of every one of them, under varying circumstances as to outputs and entry.[11]

The cost curve of Professor Chamberlin's illustrations presents the firm's costs as a function of its own level of output, independently of the output of the group. In other words, expansion or contraction of production by the group are assumed to make neither for economies nor for diseconomies in the expenditures of individual firms. Consideration of such "external" economies or diseconomies would merely affect the actual level of the equilibrium position without, however, changing the definition of it with respect to the individual sales and cost curves.[12]

The symmetry assumptions are more drastic: they require that "both demand and cost curves for all the 'products' are uniform throughout the group," which implies "all markets to be of equal size."[13] On pages 110–111, the assumption is released with the conclusion that, again, nothing need be changed in the analytical expression of equilibrium conditions: "No modification of theory is necessary in order to allow for this phase of the problem — there is needed only an interpretation of the earlier diagrams as short-cuts of exposition. Let the figure as drawn always be exact for some particular producer. It may be taken as *illustrative* of what is true for everyone within the group at levels appropriate to each. . . . It suffices

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[11] The famous "representative firm" of Marshall was meant, in part, to achieve a similar purpose. Typically, the Chamberlinian procedure is more precise than the Marshallian one, but also of more limited significance. Cf. Marshall, p. 318.

[12] Chamberlin, pp. 85–87.   [13] Chamberlin, pp. 82 and 90.

to consider a single pair of curves as *illustrative* of the group, recognizing that, on account of diversity, both as to location and as to shape, a corresponding diversity of prices, costs, and outputs . . . obtains throughout."

The symmetry assumptions are posited without any restriction as to the level of adjustment reached by the firms. The sales curves of each firm are supposed identical, throughout all the shifts they incur in any process of adjustment. On Professor Chamberlin's diagrams, a single *dd'* curve represents identically, throughout all its shifts, the position of every seller. One condition implied is that a price change by one firm, other prices remaining constant, draws equally from, or adds equally to, the market of each of the other sellers.[14] If $p_1, p_2, \ldots$ be taken as the prices charged by firms $1, 2, \ldots$ and $R_1, R_2, \ldots$ as the total revenue of the same firms respectively, we can express the assumption symbolically

$$\frac{\delta R_2}{\delta p_1} = \frac{\delta R_3}{\delta p_1} = \frac{\delta R_4}{\delta p_1} = \cdots = \frac{\delta R_1}{\delta p_2} = \frac{\delta R_3}{\delta p_2} = \cdots$$

$$\frac{\delta R_i}{\delta p_j} = \frac{\delta R_j}{\delta p_i}, \text{ where } i \text{ and } j \text{ designate any two different firms.}$$

The assumption is removed in pages 102–104, where "subclasses" and "chain relationships" come up for consideration. The conclusion of the investigation is that the simplified analysis of the large group case,[15] cannot be applied, no matter how large the number of producers, if, owing to "subclasses" or "chain relationship," the individual producer feels intensely the competition of some of his rivals.

These two groups of assumptions dominate the main bulk of the analysis and are vital to all the graphical illustrations; they are indispensable to the presentation of the three curves used:

(1) *PP'* represents the *cost curve* per unit as a function of the firm's output. The exclusion of external economies and

diseconomies prevents any shifting of the curve as the group expands or contracts production. Owing to the symmetry assumptions, PP' is, moreover, identical for every firm in the group.

✓ (2) DD' "shows the demand for the product of any one seller at various prices *on the assumption that his competitors' prices are always identical with his.* . . . Such a curve will, in fact,
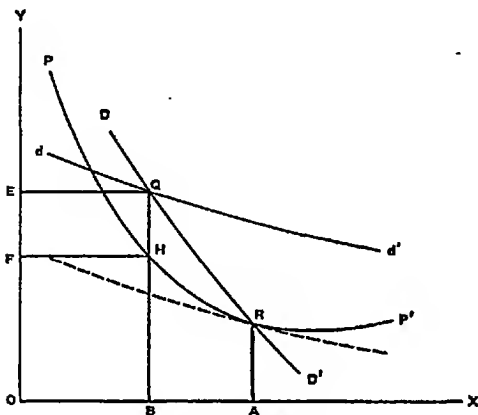
FIGURE I[16]

be a fractional part of the demand curve for the general class of product, and will be of the same elasticity." [17] DD' will thus shift its position with every change in the number of producers in the group: "it lies further to the left as there are more of them, since the share of each in the total is then smaller; and further to the right as there are fewer of them, since the share of each in the total is then larger." [18]

Owing to the symmetry assumptions, DD' represents identically, throughout its shifts, the position of each firm in the group.

✓ (3) Finally, the curve *dd'* "describes the market for the 'product' of any one seller, . . . *all other* prices being given. It shows the increase in sales which he could realize by cutting his price, *provided* others did not also cut theirs; and conversely, it shows the falling off in sales which would attend an increase in price, *provided* other prices did not also increase." [19] The curve *dd'* is evidently more elastic than the curve *DD'*: the effect of a price change by a single seller being more marked as it directly tends to redistribute the customers between that seller and his competitors.

dd' shifts with every change in the general level of "other" prices, taken as parameters. Throughout these shifts it will, owing to the symmetry assumptions, remain identical for all the firms in the group.

DD' and *dd'* are merely two special, simple cases of an infinitely variable number of assumptions as to the relationships between the various prices. Of all the possible assumptions under which the sales curve of the individual producer might be derived, these two very simple cases are kept for their illustrative value. It remains to consider the use made of them and the reasons put forth for the choice of the one or the other.

C. THE DEFINITION OF DEMAND

The market of each seller is dependent, not only upon his own price, but also on the prices charged by all his fellow sellers in the group: $R_i = R_i (p_i, p_j)$. Directly, the seller can only fix his own price p_i, but indirectly by his own actions he sometimes does induce changes in p_j as well. This will happen if, the number of sellers being few, the changes in one's price and production have a significant influence upon each of the others. In symbolic terms, $\dfrac{\delta R_i}{\delta p_j}$, *i.e.*, the change in one seller's revenue, caused by a change in another seller's price, is large enough to induce the former to readjust his price-output decisions. On the contrary, if the number of sellers be large, "any adjustment of price . . . by a single producer spreads its influence over

[19] Chamberlin, p. 90.

so many of his competitors that the impact felt by any one is negligible and does not lead him to any readjustment of his own situation." [20]

1. *The Small Group*

·In the small group case, the limited assumptions of pure economics do not suffice to determine the solution. Additional restrictions have to be introduced more or less arbitrarily, or on the basis of empirical investigations. The solution will depend on the type of assumptions one chooses to adopt.· Professor Chamberlin picks out only a few highly special solutions, narrowly dependent on his "particularizing assumptions." One of them resembles the solution reached for the case of monopoly; the others are respectively adapted from Cournot's, Bertrand's and Edgeworth's solutions of pure oligopoly.

The whole treatment of oligopoly and small numbers by Professor Chamberlin is further restricted by its unflinching adherence to the basic pattern of assumptions described above, *i.e.*, profit-maximizing behavior under sales and cost curves invariant with respect to time.[21]

(1) The monopoly-like solution is then reached under the two additional assumptions: (*a*) that each seller knows the final effect of any price move he might attempt; *i.e.*, the total effect on his sales, after the other sellers have also changed their price, under the influence of his move; (*b*) that these reactions of the competitors to each other's moves are pictured by the curve DD', *i.e.*, that any change of price by any one seller is immediately imitated by all, so that all prices in the group always move in unison. Under such conditions, it is clear that dd' does not play any role: everyone acts on the basis of DD' and feels that his own interests are completely inseparable from the

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[20] Chamberlin, p. 83.

[21] Other, and widely different, suggestions might be more realistic: we might find that the sellers engage in cut-throat competition in the hope of eliminating their rivals from the market entirely; or again, we might find that business ethics or fear of retaliation, etc. lead the sellers to a policy of inertia or of "live and let live." Professor Chamberlin examines such hypotheses in Section 5 on Excess Capacity (pp. 104-109), but without linking them either to oligopoly or to small numbers.

interests of the group as a whole. The level of output will then
be no different from what it would be if all the firms were united
under a single profit-maximizing directorship.[22]

(2) As an alternative to this perfect prescience and wisdom
of the sellers, Professor Chamberlin then considers the opposite
case when the sellers neglect *entirely* the indirect influence of
their price moves upon their own situation. Strictly speaking,
if they neglected entirely these indirect reactions, they would
behave as if both the prices and the outputs of their rivals
would remain constant. Professor Chamberlin, however, dis-
tinguishes two subcases which actually refer to a more realistic
situation in which the sellers take into account the reactions of
their own moves upon their rivals' situation.

(*a*) If they assume that rivals maintain *prices* and bear the
result of a price cut in a reduction of their sales, the solution
first offered is similar to the Bertrand solution of pure oligopoly.
The sellers will move along *dd'*, undercutting each other until
all prices fall to *AR*, *i.e.*, the point of tangency between *dd'* and
PP', *i.e.*, until their profits fall to zero.

If, before or when that level is reached some firms are selling
the maximum amount they can dispose of, it may be possible
and advantageous for others to raise their prices, setting up
the oscillations described first by Edgeworth, and then, with a
slight correction, by Professor Chamberlin in his discussion of
pure oligopoly.[23]

As compared with the pure oligopoly case, differentiation of
the product makes for greater stability in the sense that it raises
the lower limit of possible indeterminateness. It was observed
by Edgeworth that "the extent of indeterminateness diminishes
with the diminution of the degree of correlation between the
articles."[24]

[22] Under different conditions of revenue and cost, however, a unified manage-
ment may find it advantageous to redistribute output as between the plants.

[23] Throughout this chapter, I neglect all that Professor Chamberlin has con-
tributed to the study of pure oligopoly; under "monopolistic competition" I in-
clude only the original case of product differentiation, which formed the main
contribution of the new doctrines. Cp. Chamberlin, p. 8, n. 2, in the text of
the first edition and p. 9, n. 1, in the text of later editions.

[24] Papers, Vol. 1, p. 121; quoted by Chamberlin, p. 39.

(*b*) If they assume that rivals will maintain the *amount* offered at a constant level, the effect of one seller's move upon the other sellers' situation will appear in a change in the price they will receive. If, according to the symmetry assumptions, all prices are again supposed to move in unison, the ensuing process of readjustments will end in a determinate position, somewhere between the monopoly-like solution and the tangency solution.[25]

These various solutions call for very little comment. They suggest interesting possibilities, but the extremely specialized assumptions from which they are derived play a determining role in the conclusions reached. The symmetry assumptions, especially, serve here more than a mere illustrative purpose: they really shape the contents of the fundamental conditions of equilibrium.

2. *The Large Group*

The crux of the distinction between large and small numbers is really whether or not a price move by one seller induces the other sellers to follow suit, *i.e.*, whether firm i can influence the prices p_j of other firms, or whether it has to take them as a parameter of action. The large group is concerned with the latter case: the number of sellers is assumed to be so large that "any adjustment of price . . . by a single producer spreads its influence over so many of his competitors that the impact felt by any one is negligible and does not lead him to any readjustment of his own situation. A price cut, for instance, which increases the sales of him who made it, draws inappreciable amounts from the markets of each of his many competitors, achieving a considerable result for the one who cut, but without making incursions upon the market of any single competitor sufficient to cause him to do anything he would not have

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[25] An interesting interpretation of the difference between Cournotesque and Bertrandesque assumptions is suggested by Mr. R. F. Kahn in "The Problem of Duopoly," *Economic Journal*, XLVII (1937), 1–20. Mr. Kahn's argument, however, leads him in general to "asymmetrical" solutions, radically different from Professor Chamberlin's setup.

done anyway." [26] In symbolic terms, $\dfrac{\delta R_i}{\delta p_j}\left(=\dfrac{\delta R_j}{\delta p_i}\right)$ is of insignificant size, with respect to the other elements of the profit maximization calculations of the seller.

In this case, i will maximize profits along the demand curve dd', built as for constant values of all other prices p_j. If all the firms but firm i were in equilibrium, the movement of i toward equilibrium would induce no reaction and would be final. On Professor Chamberlin's graphs, however, the movement of the firm toward its equilibrium position is accompanied by a process of readjustment on the part of all the firms in the group, so that the expectations of i are unfulfilled. In fact, the firm glides, not along dd', but along DD', *i.e.*, along the curve expressing the change in one firm's market, in answer to a general movement of price throughout the·group.

The substitution of the market curve DD' for the subjective curve dd' results again from the symmetry assumptions used by Professor Chamberlin. The position of one firm depicting identically the position of all, when one firm is in disequilibrium all the other firms are in disequilibrium in the same direction and to the same extent. The expectations of i are disappointed not because his price move induces any of his competitors to follow suit, but because his competitors happened to be also in disequilibrium, and would have moved anyway on their own initiative, no matter what the decisions of i were.

The general conditions of equilibrium for the group will be, as already indicated: (1) the equality of marginal revenue and marginal cost, which solves the equilibrium problem of the individual firm; (2) the equality of average (or total) revenue and average (or total) cost, which is supposed to solve the problem of stability in the number of firms where entry is free (cf. above, for the case of closed entry).

Both conditions are compressed by Professor Chamberlin ⌐ into a single one: equilibrium will obtain at the point of tangency

between average revenue and average cost curves (or, identically, total revenue and total cost curves).[27]

The conclusion is illustrated in three successive steps: (1) The first one (pp. 83–84) isolates the influence of free entry. Each firm is assumed throughout always to be in a position of individual equilibrium: *i.e.*, its marginal cost equals its marginal revenue. The assumption of free entry is then tantamount to the assumption of the second condition: average cost equals average revenue. (2) The second one (pp. 90–92) isolates the influence of the struggle of each firm toward individual equilibrium. The number of firms is assumed to be constant throughout the argument, but at a level that would ensure equality between average cost and average revenue if each firm were also in a position of individual equilibrium (*i.e.*, marginal revenue equal to marginal cost). When all the firms have moved to such a position, it is then a foregone conclusion that the two conditions will be realized at once.[28] (3) The third step (pp. 92–93) simply brings together the two influences just presented in isolation. Each firm, being initially at a point of individual disequilibrium, moves along *dd'* until marginal cost equals marginal revenue. At the same time, the number of firms failing to correspond to a final equilibrium position, abnormal profits or losses induce some firms to enter or leave the field. Hence a position of stability will be reached only when

[27] On page 93 of his *Theory of Monopolistic Competition*, Professor Chamberlin includes in his definition of equilibrium the additional condition that "*DD'* must intersect both *dd'* and *PP'* at the point of tangency." This second condition, however, adds nothing to the tangency condition. It follows from the symmetry assumptions on which the definition of *DD'* is based, that the equilibrium point must lie both on *dd'* and *DD'*; the tangency of *PP'* and *dd'* then carries automatically the implication that the equilibrium point also lies on *PP'*. The slope of *dd'* being different from the slope of *DD'*, and *dd'* being tangent to *PP'*, the point common to *DD'* and *PP'* is a point of intersection.

[28] Professor Chamberlin's illustration of this case in figure 14 of his book (reproduced here, p. 26), exhibits a situation where *each* firm produces less than its individual equilibrium requires. Prices and costs are higher than at equilibrium; and in the example it so happens that this situation makes for supernormal profits. But the logic of the case where production is below equilibrium might as well make for losses, or even (as a chance occurrence) for absence of either losses or profits: the reader can easily convince himself of this by imagining the downward sloping segment of the cost curve to be somewhat steeper, so as to intersect *DD'* at, or to the right of, *Q*.

both conditions (equality of marginal cost and revenue, and equality of average cost and revenue) happen to be simultaneously satisfied.

3. *The Tangency Solution under Large and Small Group Assumptions*

It remains to comment briefly on a peculiarity of Professor Chamberlin's solutions which has so far passed unnoticed and which will prove to be very revealing of his technique and of the caution with which it must be handled. I have in mind the formal similarity between the "tangency solution" of the small group case and the solution reached for the large group under free entry. Both solutions are defined by the point R (cf. Figure I, p. 26) of tangency between the average cost curve and the sales curve of the seller.

This tangency solution may be analyzed, as we have seen earlier, in two component parts: the equation of marginal revenue and marginal cost, on the one hand, and the equation of average revenue and average cost, on the other.

(1) The equation of average revenue and average cost has been presented above as a requirement for group equilibrium only in the case of free entry. When entry is free, such a condition must be introduced in order to prevent a fluctuation of production, owing to entry or exit of firms in, or from, the group. The small group setup, however, seems to imply that entry is closed; such is, at any rate, the assumption on which all the other small group solutions of Professor Chamberlin are derived. And closed entry can accommodate itself to any level of positive profits. The equation of average cost and average revenue can only be, in the small group case, a rather unlikely chance occurrence; it is in no way a condition of equilibrium.

(2) Waiving this first aspect of the tangency solution, I now come to a more important matter. In the small group case as well as in the large group case, the equation of marginal revenue and marginal cost expresses the condition of equilibrium as to the output decision of the individual firm: the inference of this condition from the fundamental assumption of

profit-maximization is as generally applicable as the latter
assumption itself. But, the precise meaning of the marginal
revenue concept must be carefully examined.

In the large group case, marginal revenue is calculated on
the basis of unchanging prices of all commodities but the one
sold by the firm under consideration. In the small group case,
it is constructed successively upon the following alternative
assumptions: (*a*) general and parallel movement of all com-
petitors' prices; this gives rise to the monopoly-like solution;
(*b*) unchanging amounts sold by all sellers but the one under
consideration; this gives rise to the Cournot type of solution;
(*c*) unchanging prices of all commodities but the one sold by
the firm; from this (the Bertrandesque assumption) are derived
the tangency solution and, under very special circumstances, the
Edgeworth-Chamberlin solution.

The last mentioned assumption is identical to the one fol-
lowed for the large group case; no wonder, then, that the two
solutions appear formally identical. In both cases, the firm's
equilibrium is established at the intersection of marginal cost
with a marginal revenue curve constructed as of unchanging
prices of all commodities but the one sold by the firm under
consideration.

This apparent identity conceals significant differences be-
tween the two cases, first as to the validity of the assumptions
from which the equilibrium solution is derived, and secondly
as to the dynamics of the equilibrating process.

The use of a sales curve based on the assumption that other
prices remain constant is perfectly justified in the large number
case. It is precisely the purpose of the large number setup to
restrict the attention to such cases where no seller has any
significant influence upon any other seller's situation. Prices as
well as quantities sold by other sellers are then to be taken as
parameters of action by each firm. In the small group case,
however, there is no warrant that the firms will ignore their
influence upon other sellers' prices. Professor Chamberlin's use
of a sales curve based on such a type of behavior is completely

arbitrary; it can be nothing but a sheer assumption, a *deus ex machina*, which, if presented without further justification, serves only to evade, not to solve, the problem at issue.

Supposing for the moment that the small group sellers behave, in fact, in such an extraordinary manner, the question still remains: ignoring the problem of entry, does the small group case give rise to the same type of reactions as the large group case?

The general condition of individual equilibrium is, as we have seen above, identical: for each firm marginal cost must equate marginal revenue, calculated as of unchanging prices of all commodities but the one sold by the firm under consideration. The stability, however, of this equilibrium is very different in each case, as is also the pattern of movement of the firms when not all of them have reached the equilibrium position. In the large group case, the movement of one firm does not induce any reaction on the part of the others, and if all the firms but one were in equilibrium, the movement of that one firm toward equilibrium would cause no further change. Similarly, an erratic movement of one firm, when all are in equilibrium, would be unnoticed by the other firms and would create no disturbance in the general position of equilibrium reached by the sellers in the group.

Not so in the small group case where, whether the firms are in equilibrium or not, the movements of one single firm can suffice to modify the conditions of equilibrium for all of them. Supposing every firm (or every firm but one) to be in equilibrium at the start, a price change by one is enough to throw all the others out of equilibrium and to set the ball rolling again.

This fundamental cleavage between the two cases is veiled, in Professor Chamberlin's exposition, by the use of the same curve *DD'* both in the case of small numbers and of large numbers. In the case of large numbers, *DD'* is not a reaction curve: in fact, there exist no reactions to the moves of one seller, so that *dd'* would be the only relevant curve and the movements along *dd'* would be final if it were not for the initial and simultaneous disequilibrium of all the firms. In the small numbers

case, *DD'* plays a more vital role: it then depicts the mode of reaction (adoption of the same price) of the competitors to any move attempted by one of them. The gratuitous assumption of such a type of adjustment is vital to the solution reached for the small group problem, and restricts enormously its generality and significance.

2. MRS. ROBINSON'S "ECONOMICS OF IMPERFECT COMPETITION"

The appearance of *The Theory of Monopolistic Competition* was followed, within the year, by the publication of Mrs. Robinson's *Economics of Imperfect Competition.*[29] Ever since, the two authors have been referred to together as the co-inventors of this new development of the theory of value. Professor Chamberlin,[30] however, if not Mrs. Robinson,[31] insists on the "dissimilarities" of their two approaches. As his contention has not been accepted without protests,[32] the question cannot be ignored in this attempt to disentangle a common body of monopolistic competition doctrines.

If some light is to be thrown on the controversy, the questions at issue must be kept clearly separate: (1) are both writers tackling the same problem; (2) are they viewing its solution along the same general lines of approach; (3) do they use the same tools and techniques; (4) do they arrive at the same solution?

A. THE PROBLEM UNDER ATTACK

Both theories, of imperfect and of monopolistic competition, were evolved in reaction against the traditional theory of value,

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[29] In her preface, dated October 1932, Mrs. Robinson mentions the appearance of Professor Chamberlin's book after her own work was already completed.

[30] Cf. E. H. Chamberlin, "Monopolistic or Imperfect Competition," *Quarterly Journal of Economics*, LI (1937), 557–580.

[31] Mrs. Robinson has merely insisted on distinguishing her "market imperfection" from Professor Chamberlin's "product differentiation." Cf. J. Robinson, "What is Perfect Competition?" *Quarterly Journal of Economics*, XLIX (1934), 104–120; 112–113 especially.

[32] N. Kaldor, "Professor Chamberlin on Monopolistic and Imperfect Competition," and Professor Chamberlin's "Reply," *Quarterly Journal of Economics*, LII (1938), 514–538.

against the cleavage it establishes between these two apparently exclusive and opposite classes of phenomena, monopoly and pure competition, and against the practical predominance of the second throughout economic theory. The indictment brought forth against traditional concepts, the phenomena pointed out as calling for theoretical recognition by economic science, are in both expositions strikingly identical. There is, I think, little doubt that Professor Chamberlin and Mrs. Robinson offer the same motives for their dissatisfaction with purely competitive assumptions and state as their main purpose the investigation of the same type of facts and their integration into a modern theory of value. In short, both authors lay great stress on the dependence of pure (or perfect) competition upon very restrictive assumptions, which limit narrowly the field of applicability of the theory: the presence of a large number of sellers on the one hand and, more important, the absence, on the other hand, of product differentiation or, in Mrs. Robinson's terminology, market imperfections.

While Mrs. Robinson confines her attention to the second problem, Professor Chamberlin devotes a long chapter to the subject of fewness of numbers, or oligopoly. But the most original part of his work has to do with "monopolistic competition," *i.e.*, competition between the sellers, whether few or numerous,[33] of a non-homogeneous product.[34]

Mrs. Robinson takes great pains to distinguish her "market imperfections" from Professor Chamberlin's "product differentiation." [35] For those who doubt the validity of my contention that the two authors are tackling, in fact, the same general problem, I hope that the following parallel will be convincing.

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[33] Chamberlin, 3rd edition, p. 9, n. 1.

[34] Cf. Chamberlin, 1st edition, p. 8, n. 2, where the name "monopolistic competition" is explicitly reserved for product differentiation; in later editions, product differentiation is only one of the two possible meanings of monopolistic competition.

[35] J. Robinson, "What is Perfect Competition?" *Quarterly Journal of Economics*, XLIX (1934), 112–113. For a discussion of the arguments advanced in that article, I refer the reader to E. H. Chamberlin "Monopolistic or Imperfect Competition?" *Quarterly Journal of Economics*, LI (1937), 557–580, especially 568–570.

J. Robinson

In the older text-books it was customary to set out upon the analysis of value from the point of view of perfect competition. . . . But somewhere, in an isolated chapter, the analysis of monopoly had to be introduced. This presented a hard, indigestible lump which the competitive analysis could never swallow . . . (p. 3).

Moreover, the relations between the real world and the competitive analysis of value were marred by frequent misunderstandings (p. 3).

The economists, misled by the logical priority of perfect competition in their scheme, were somehow trapped into thinking that it must be of equal importance in the real world. When they found in the real world some phenomenon . . . which is inconsistent with the assumptions of perfect competition, they were inclined to look for some complicated explanation of it, before the simple explanation occurred to them that the real world did not fulfil the assumptions of perfect competition (pp. 3–4).

The traditional assumption of perfect competition . . . depends, in the first place, upon the existence of such a large number of producers that a change in the output of any one of them has a negligible effect upon the output of the commodity as a whole, and it depends, in the second place, upon the existence of a perfect market. . . . If the demand curve for an individual producer is perfectly elastic, he is able by the least reduction in price to attract an indefinite amount of custom, and by the least rise in price he will forfeit the whole of his sales (pp. 88–89).

E. H. Chamberlin

Economic literature affords a curious mixture, confusion and separation, of the ideas of competition and monopoly. On the one hand, analysis has revealed the differences between them and has led to the perfection and refinement of a separate body of theory for each . . . it has, in the main, been assumed that . . . all the phenomena to be explained are *either* competitive *or* monopolistic, and therefore that the expedient of two purified and extreme types of theory is adequate (p. 3).

On the other hand, the facts of intermixture in real life have subtly worked against that complete theoretical distinction between competition and monopoly which is essential to a clear understanding of either (p. 3).

Quantitatively, competitive theory has dominated — indeed, the theory of competition has been so generally accepted as the underlying explanation of the price system that the presumption is in its favor; its inadequacy remains to be proved . . . (pp. 4–5).

Because *actual* competition (rarely free of monopoly elements) is supposedly explained by the theory of *pure* competition, familiar results really attributable to monopolistic forces are readily associated with a theory which denies them. This association of the theory of competition with facts which it does not fit has not only led to false conclusions about the facts; it has obscured the theory as well (p. 3).

In the first place, there must be a large number of buyers and sellers so that the influence of any one or of several in combination is negligible. . . . Secondly, control over price is completely eliminated only when all producers are producing the identical good and selling it in the identical market . . . (p. 7).

. . . each seller accepts the market price and can dispose of his entire supply without materially affecting it (p. 10).

The concepts developed run directly against the exclusive emphasis of Marshall upon "industrial" equilibria of supply and demand, unrelated to the individual firm's behavior and problems.

On the contrary, Cournot, Walras, Pareto consistently place the individual entrepreneur at the center of their system. The concepts of groups and industries play a relatively minor role in their explanation of the economic world. And yet, nowhere in their work do we find the explicit assertion of a "monopolistic competition" case.

Cournot has a chapter on "limited competition" which refers simply to oligopoly.[64] Except for an entirely isolated chapter on monopoly,[65] Walras confines himself to the discussion of "free competition." Pareto, and after him Pietri-Tonelli, make much of a distinction between "incomplete," "limited," or "imperfect" competition on the one hand, and on the other "complete," "unlimited," or "perfect" competition.[66] We soon discover, however, that by such a terminology a monopolist can be operating under conditions of perfect competition.[67] In fact, the "imperfection of competition" has nothing to do with the monopolistic or competitive character of the market, but refers to the conditions of production and the shape of the cost curve; surprisingly enough for the reader who has seen Mrs. Robinson's imperfect competition emerge from a discussion of decreasing costs, the Paretian imperfect competition is linked not with decreasing, but with increasing costs.[68]

Under these circumstances, it is not surprising to find so far in economic literature no realization of the fact that the essentials of monopolistic competition theories are already present

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[64] Cournot, Chapter VII, pp. 79–89.

[65] L. Walras, *Eléments d'Economie Politique Pure* (édition définitive, Paris, 1926), (quoted later as "Walras"), 41e leçon, pp. 435–441.

[66] V. Pareto, *Manuel d'Economie Politique* (2e édition, Paris, 1927), pp. 185–207; quoted below as "*Manuel*"; A. de Pietri-Tonelli, *Traité d'Economie Rationnelle* (Paris, 1927), pp. 119–122 and 150–160; quoted below as "Pietri-Tonelli."

[67] Pietri-Tonelli, p. 159: "Supposons que ce soit le producteur . . . qui opère sous condition de monopole. . . . S'il s'agit de marchandises produites par la concurrence complète. . . ."

[68] Cf. Note appended to this chapter, pp. 58–61.

E. H. Chamberlin

If his product is slightly different from others, it would be a mistake for the producer to proceed on the assumption that he can sell any amount of it at the going price, since buyers might prefer other varieties and take larger amounts of his own only at a price sacrifice or through the persuasion of advertising. . . . Anything which makes buyers prefer one seller to another . . . differentiates the thing purchased to that degree, for what is bought is really a bundle of utilities, of which these things are a part (pp. 7–8).

A general class of product is differentiated if any significant basis exists for distinguishing the goods (or services) of one seller from those of another. Such a basis may be real or fancied, so long as it is of any importance whatever to buyers; and leads to a preference for one variety of the product over another. Where such differentiation exists, even though it be slight, buyers will be paired with sellers, not by chance and at random (as under pure competition), but according to their preferences (p. 56).

As examples of product differentiation, Professor Chamberlin cites:

convenience of the seller's location, . . . exclusive patented features; trade-marks; trade names; peculiarities of the package or container, . . . singularity in quality, design, color or style, . . . conditions surrounding its sale [of the product], . . .

efficiency, personality [of the seller], . . . his way of doing business, his reputation for fair dealing, courtesy, . . . and all the personal links which attach his customers either to himself or to those employed by him, etc. (pp. 8 and 56).

Patents are not mentioned in Mrs. Robinson's listing. If this omission be significant, it would probably indicate that Mrs. Robinson does not question the traditional view that patents should be regarded as monopolies, *i.e.*, non-competitive. This would be in keeping with Mr. Kaldor's distinction between imperfect competition and institutional monopolies.[36] It would also help to bear out Professor Chamberlin's contention that Mrs. Robinson still conceives of monopoly and competition as mutually exclusive, and not as analytical and complementary aspects of one and the same reality.

B. THE GENERAL APPROACH

While in agreement on the description of the empirical problem to be faced, the two authors diverge in a striking manner when they come to outline the general strategy they will follow in their theoretical attack. Both are dissatisfied with the traditional dichotomy in the theory of value between monopoly and pure competition. But the remedies they suggest are in sharp contrast: Mrs. Robinson, following Piero Sraffa's suggestion,[37] solves the dilemma by getting rid of one of its two horns: the analysis of monopoly is made to "swallow up" completely the analysis of competition.[38] By contrast, Professor Chamberlin finds that "to discard either competition or monopoly is to falsify the result" and that "the theory of monopoly, although the opening wedge, is very soon discovered to be inadequate."[39] Accordingly, his own attack is described as a blending of the two elements.

The true significance of these contrasting methods of approach, however, cannot be properly understood without a clear grasp of what monopoly means to both authors. Indeed, Mrs. Robinson uses the term in two very different senses, neither of which corresponds to Professor Chamberlin's concept of mo-

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[36] Cf. N. Kaldor, "Professor Chamberlin on Monopolistic and Imperfect Competition," *Quarterly Journal of Economics*, LII (1938), 528–529, and my discussion below, pp. 153–155.

[37] P. Sraffa, "The Laws of Returns under Competitive Conditions," *Economic Journal*, XXXVI (1926), 535–550.

[38] Robinson, pp. 4–6.   [39] Chamberlin, pp. 63 and 68.

nopoly. The question cannot be isolated from fundamental problems of definitions (concerning the concepts of a group, an industry, a commodity) which I shall treat together in Chapter II.

C. TOOLS AND TECHNIQUES

More revealing perhaps than the general description of their intentions and procedures are the concrete techniques used by the two authors. The difference of approach appears in the open in the diagrammatic presentation. Mrs. Robinson's diagrams resemble closely an illustration of monopoly pure and simple. When the individual firm has moved toward its equilibrium position, a final point of rest is reached and there is nothing to correspond to Professor Chamberlin's DD' curve and to the making of the attainment of equilibrium by the single firm dependent on other firms' moves. The divergence results from a difference in the assumptions and tools used: firstly, Mrs. Robinson makes only limited use of the "symmetry" assumptions that characterize so much of Professor Chamberlin's exposition and underlie all his diagrams; secondly, and most important, the two authors use diammetrically opposite concepts to define their most essential tool of analysis, *i.e.*, the sales curve on the basis of which the individual seller derives his marginal revenue and tries to maximize profit.

1. *The Particularizing Assumptions*

In order to draw up a supply curve, Mrs. Robinson introduces exactly the same particularizing assumptions as are used by Professor Chamberlin: absence of external economies and diseconomies, and identity of cost and sales curves for all the firms in the industry. This identity is preserved throughout all shifts in demand, and ensures that all firms charge the same price.[40]

These assumptions, however, are merely indicated as the ones that would be needed if one wanted to define a supply curve when the market is not perfect. Mrs. Robinson immediately

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[40] Robinson, pp. 85, n. 1 and 86; or 98.

discards them, rightly arguing that they are "unplausible." [41] Instead of assuming that the firms are selling identical amounts at identical prices, on the basis of identical cost and sales curves, she builds her analysis upon the tacit hypothesis that every firm in the group but one is in equilibrium. The determination of an equilibrium position by that single firm is then studied in isolation. No scheme of reactions within the group, such as is described by Professor Chamberlin, is involved.[42] As influences external to the individual seller, Mrs. Robinson retains for study, not changes in production by other firms in the group, but only the entry or exit of firms and arbitrary shifts in the total demand for the commodity turned out by the industry.[43]

2. *The Definition of Demand*

The most important tool used by the value theorist is the sales curve on which the seller bases his profit-maximizing calculations. It is all the more striking to reflect how little attention has been given to the fact that Mrs. Robinson and Professor Chamberlin use absolutely contrasting concepts to define the sales curve of their individual seller.

Marshall's demand curve for the commodity produced by an industry was drawn under a *cæteris paribus* proviso as to the prices of all other commodities.[44] Applied to the demand for the differentiated product of the single firm, the importance of this proviso looms larger than ever. This explains why Mrs. Robinson uses a very different definition for the firm's sales curve: "The demand curve for the individual firm may be conceived to show the full effect upon the sales of that firm which results from any change in the price which it charges, whether it causes a change in the prices charged by the others or not." [45]

Professor Chamberlin uses mostly, though not exclusively, the Marshallian concept. In view of this difference, the two analyses might be expected to run in a very dissimilar direction.

[41] Robinson, pp. 87 and 88.
[42] Robinson, Chapter III, pp. 47–59.
[43] Robinson, Chapters IV and VII, pp. 60–75, and 92–101.
[44] Marshall, p. 100.   [45] Robinson, p. 21.

(1) And so it does in the small group case. As against Professor Chamberlin's alternative solutions, Mrs. Robinson's conditions of equilibrium are no different in the small group than in the large group case. Indeed, such a distinction is not even mentioned in her exposition. The whole problem of oligopoly is assumed to take care of itself through the device of including in the sales curve all oligopolistic influences and reactions. "In an industry which is conducted in conditions of imperfect competition a certain difficulty arises from the fact that the individual demand curve for the product of each of the firms composing it will depend to some extent upon the price policy of the others. Thus, if one raises its price the demand curves for the others will be raised. This may cause them to raise their prices also, and the rise in their price will react upon the demand for the commodity of the first firm. In drawing up the demand curve for any one firm, however, it is possible to take this effect into account. The demand curve for the individual firm may be conceived to show the full effect upon the sales of that firm which results from any change in the price which it charges, whether it causes a change in the prices charged by the others or not. It is not to our purpose to consider this question in detail. Once the demand curve for the firm has been drawn, the technique of analysis can be brought into play, whatever the assumptions on which the demand curve was drawn up." [46]

Among Professor Chamberlin's alternative solutions of the small group case, only one bears any resemblance to the single, generalized solution presented by Mrs. Robinson. I refer to what I have called the "monopoly-like" solution. In this case, Professor Chamberlin makes no use of the Marshallian *"cæteris paribus"* curve, but assumes also that equilibrium is reached immediately by the seller along a sales curve that takes into account his "full influence, direct and indirect, upon the situation." [47] In contrast with Mrs. Robinson, however, this curve is given more definiteness, owing to the particularizing assumption that the influence of the sellers upon each other

[46] Robinson, p. 21.   [47] Chamberlin, p. 100.

consists, in fact, in the preservation of a complete price uni-
formity throughout the group.

(2) In the large group case the two definitions, formally so
different, recover a sales curve identical in content. This results
from the definition of the large group as excluding any reaction
by other firms to the moves of any single seller. Where such
reactions are excluded, the Robinsonian curve reduces in fact
to the Marshallian one.

3. *The Diagrams*

The contrast between Mrs. Robinson's and Professor Cham-
berlin's diagrams is due to the combined result of these two
differences in their techniques. While Professor Chamberlin's
diagrams picture vividly, through the use of the curve DD', the
influences external to the firm upon the progress toward the
equilibrium of the group, Mrs. Robinson's diagrams seem very
often to describe nothing more than the old traditional case of
monopoly pure and simple.[48]

In the large group case the two definitions of the sales curve
come, as we have seen, to mean the same thing. The only dif-
ference left is then the difference in starting point: if Professor
Chamberlin had assumed an initial position of equilibrium for
all the firms but one, the curve DD' would not appear and dd'
would not shift. The diagram would be identical with that of
Mrs. Robinson.

In the small group case, Professor Chamberlin's dd' curve
would shift even if all the firms but one had been in equilibrium
at the start: the action of that one would suffice to disturb
equilibrium all around, and the consequent reactions of the
other firms would cause a shift in dd'. If Mrs. Robinson's curve
does not shift, it is because, by virtue of its definition, it in-

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[48] The use of *marginal* curves, however, gives to the diagrams an elegance
and clarity that far surpasses the clumsy illustrations of Marshall and Cham-
berlin. For many purposes *total* revenue and cost curves would simplify the
exposition even further. The argument on pages 60–61, for instance, of *The
Economics of Imperfect Competition*, would gain enormously in symmetry and
elegance if, instead of marginal cost and elasticity of demand, use were made
of the two symmetrical curves of total cost and revenue.

cludes already, in contrast to the Marshall-Chamberlin curve, the effects of all these reactions.

"Full equilibrium . . . requires a double condition, that marginal revenue is equal to marginal cost, and that average revenue (or price) is equal to average cost. The double condition of full equilibrium can only be fulfilled when the individual demand curve of the firm is a tangent to its average cost curve." [49]

Mrs. Robinson thus seems to present as of general validity the very conditions of equilibrium which Professor Chamberlin proposes only for the case of large numbers, under conditions of free entry.[50]

The distinction between large numbers and small numbers does not appear in Mrs. Robinson's exposition. As we shall see later on,[51] her peculiar definition of the sales curve of the firm dodges completely the problem of oligopolistic indeterminacy.

She recognizes, however, the phenomenon of closed entry under two different headings, and, on both occasions, she leaves room for what would appear in the Chamberlinian analysis as supernormal profits, separating average cost from average revenue.

The first case is an extreme case of closed entry, in which the obstacles to entry do not reduce simply to differences in costs. "In trades into which there is no possibility of entry, such as the provision of public-houses in a district where a fixed number of licenses is granted, there is no upper limit to profit, though there must be a lower limit at the level of profits which is just sufficient to maintain the existing number of firms in business." [52]

The more general way of escape, however, from a rigid "no-profit" interpretation of her tangency solution is provided by

[49] Robinson, p. 94.
[50] Cf. above, p. 31; and Chamberlin, p. 93.   [51] Below, p. 68 ff.
[52] Robinson, p. 93; cf. also "What is Perfect Competition?" *Quarterly Journal of Economics*, XLIX (1934), 107.

her definition of costs. Indeed, costs are made to include normal profits on the one hand,[53] and, on the other, all kinds of rents, entrepreneurial as well as factorial.[54] Professor Chamberlin also includes factorial rents and entrepreneurial wages (inclusive of entrepreneurial rents, *i.e.*, differential wages of management) as costs,[55] but his definition of normal profits for the marginal firm is far less inclusive than Mrs. Robinson's. For her, "the level of normal profits must be defined in respect to the particular industry. The difficulties of entering the trade will be reflected in the level of profits, just as the difficulty of becoming a doctor or a civil servant is reflected in the incomes earned by doctors and civil servants." [56] For Professor Chamberlin, on the other hand, the "difficulties of entering the trade" are considered as making possible the maintenance of excess profits, pictured on his diagrams as differences between revenue and cost.

In this case, the divergence between the conditions for the equilibrium of the industry in Robinson's and in Chamberlin's expositions appear to be mainly terminological. More recently, however, Professor Chamberlin has challenged the concept of "freedom of entry" under conditions of monopolistic competition, and restated his theory of profit without reference to the "industry." It will be better, however, to take this up in a later part of this study.[57]

Thus, Mrs. Robinson's conditions of equilibrium come to the following:

(1) As far as the *firm's equilibrium* is concerned, she requires, just as Professor Chamberlin, that marginal cost be equal to marginal revenue. This formal identity, however, develops significant differences when the divergence in the defini-

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[53] Robinson, p. 93.
[54] Robinson, p. 125.
[55] Chamberlin, p. 22.
[56] Robinson, p. 93. Cf. also, her articles "Imperfect Competition and Falling Supply Price," *Economic Journal*, XLII (1932), 546–547, and "What is Perfect Competition?" *Quarterly Journal of Economics*, XLIX (1934), 107.
[57] Cf. below, pp. 118–119 and 162–163; and E. H. Chamberlin, "Monopolistic or Imperfect Competition?" *Quarterly Journal of Economics*, LI (1937), 566–568.

tion of demand leads to the use of demand curves dissimilar in content.

(2) The *equilibrium of the industry* is expressed by Mrs. Robinson in the condition that average cost be equal to average revenue (which is Professor Chamberlin's formulation for the case of large numbers when entry is free). The profits which Professor Chamberlin associates with closed entry find their way into her analysis, through the admission of the rather exceptional cases of absolutely closed entry and, more important, through the way in which costs and normal profits are defined.

As a result, there is revealed a close similarity between Mrs. Robinson's and Professor Chamberlin's conditions of equilibrium. When terminological differences are swept away, there remain only the very dissimilar handling of oligopolistic situations and the increasing qualifications and doubts with which Professor Chamberlin surrounds the concept of entry.

3. H. VON STACKELBERG'S "MARKTFORM UND GLEICHGEWICHT"

One common feature of both *The Theory of Monopolistic Competition*, and *The Economics of Imperfect Competition* is their insistence on the maximizing problem of the individual seller and their summary treatment of the problem of the interrelationships between the firms.[58] Another is the role played in their exposition by the concept of a group or industry.[59] On both points, Stackelberg's *Marktform und Gleichgewicht* [60] comes into sharp contrast. The exposition does not draw upon the concept of group or industry and the insistence is wholly upon the problem of interdependence of the firms. In this respect Stackelberg's book is the exact complement of Mrs. Robinson's and Professor Chamberlin's works.

Another characteristic of Stackelberg (not unrelated to his insistence on the problem of firms' interrelationships) is the prominent position given, in his analysis, to oligopoly elements.

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[58] Cf. below, pp. 67–70 and 76–78.
[59] Cf. below, pp. 81–85.
[60] H. von Stackelberg, *Marktform und Gleichgewicht* (Wien und Berlin, 1934); quoted later as "Stackelberg."

Product differentiation is conceived as an additional complexity added to the more simple problem of the competition between a few sellers of an identical commodity. And so for him the pure oligopoly case appears as a "simplified form of the central problem of imperfect competition." [61] Accordingly, he starts from a study of pure duopoly and builds up, from there on, to oligopoly and monopolistic competition.

A. PURE DUOPOLY

In the simple case where there are two sellers only, Stackelberg views each seller as confronted with the following alternative: (1) either considering the other seller's behavior as given, and adapting his own policy to the present price-output decisions of his rival; or, (2) setting the pace himself and, in maximizing profit, taking account of the fact that his own decisions are viewed by the other seller as a datum, influencing this other seller's choice of an optimum output.

Faced with these two possibilities, each seller will decide on the one or the other policy, depending on which appears to be the more advantageous to him in the actual case considered. A stable equilibrium will arise only if it just happens that one seller's advantage is to lead, while the other benefits more by adapting passively his decisions to the positions taken by the first. This situation Stackelberg baptizes "asymmetrical dyopoly." [62] But if, as is more likely, both of them see their advantage in securing the same position, no matter whether it be the one of leadership or the one of passivity, the conditions of equilibrium become incompatible for the two sellers. A struggle will develop where each tries to bend the other to his own will. To achieve this, he will attempt to bluff his rival into believing that, whatever the latter does, he himself will cling imperturbably to the position aimed at. If both men try to act in this

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[61] H. von Stackelberg, "Neues Schrifttum über unvollständigen Wettbewerb," *Schmollers Jahrbuch*, LIX (1935), 705; (translation mine).

[62] The greek derivation "dyo" being more in order than the latin "duo." Cf. "Neues Schrifttum . . . ," p. 704. I shall, however, cling to the term duopoly, the illegitimate birth of which is by now covered up, in English economics, by a long tradition of uncontested supremacy.

manner, they will end up by doing more harm to themselves than they would by accepting the less favorable of the two positions. Finally, one of them will give up fighting and will resign himself to the position complementary to the one conquered by the victor. But pure economic analysis cannot predict *which* of the two this will be, nor *when* this outcome will occur. Moreover, the equilibrium so achieved will be highly precarious, as the vanquished is always free to reconsider his decision and start the fight anew.

B. PURE OLIGOPOLY

The number of possible attitudes increases along with the number of sellers: each may find it to his advantage to assume a position of leadership vis-à-vis some (or all, or none) of his rivals, while acting passively toward the others. The conditions corresponding to the previous asymmetrical case, and giving rise to a stable equilibrium, would then require such a unique combination of circumstances as to be ruled out in practice. Thus oligopoly usually results in fighting and chaos, unless determinateness is inserted through extra-economic influences such as the intervention of the political umpire. And, in this way, economic theory is, in the last chapter of Stackelberg, made agreeable to the corporative schemes of the Third Reich.

C. MONOPOLISTIC COMPETITION

Even after differentiation of the product is introduced (under the heading of "relationships between markets," each differentiated commodity being conceived as having its own particular market), Stackelberg goes on throughout most of his book, emphasizing oligopolistic interdependence and the resulting indeterminateness. The recognition of differentiation indeed increases the indeterminateness, for the active and passive attitudes may now be subdivided under two headings: active or passive attitude with regard either to output or to price. No such alternative presented itself in the case of pure oligopoly, for then, only one price being possible on the market, the oligopolists were not free to determine price but only to influ-

ence it indirectly through the channel of their quantity deci-
sions. On the contrary, the competing monopolists have
the choice between either determining the price and letting the
buyers decide on the quantity demanded, or determining the
quantity offered for sale and leaving the price to be worked
out on the market by the competitive bidding of the buyers.
Each of these two policies gives different results and the seller
will again have to decide which will give him the greater profit.

And so Stackelberg is led by his emphasis on oligopoly ele-
ments to object to Chamberlin's results as being only a generali-
zation of a special case: his solution is branded as being based
on the arbitrary assumption that every seller adapts himself
passively to the market situation, as determined by the present
position of all other sellers.

Despite his sweeping condemnation of the Chamberlinian
solution, Stackelberg himself, in a rather isolated paragraph of
his book, pictures a situation similar to the large group case of
Professor Chamberlin and argues that the solution is then de-
terminate. "If the number of monopolists sellers is very high,
the case may occur when every monopolist neglects his influence
on the behavior of the others, since this influence is very weak.
We get then between the monopolists a relation similar, and yet
stable, to the one of the oligopolists in the case of Cournot's
oligopoly. Everyone limits himself to the monopolistic domina-
tion of his own market." [63] Stackelberg accepts this solution on
the double condition that (1) the demand side of the market be
atomized, and that (2) the selling monopolies be numerous.

In his indiscriminate condemnation of the whole discussion
of product differentiation by Chamberlin, Stackelberg appears
to have overlooked the fact that the "large group" scheme is of
the same type as the one he himself proposes in the passage just
quoted.

4. MONOPOLISTIC COMPETITION IN PARETO

Monopolistic competition theories constitute a great advance
over the Marshallian stage of particular equilibrium economics.

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[63] Stackelberg, p. 43; (translation mine).

The concepts developed run directly against the exclusive emphasis of Marshall upon "industrial" equilibria of supply and demand, unrelated to the individual firm's behavior and problems.

On the contrary, Cournot, Walras, Pareto consistently place the individual entrepreneur at the center of their system. The concepts of groups and industries play a relatively minor role in their explanation of the economic world. And yet, nowhere in their work do we find the explicit assertion of a "monopolistic competition" case.

Cournot has a chapter on "limited competition" which refers simply to oligopoly." Except for an entirely isolated chapter on monopoly." Walras confines himself to the discussion of "free competition." Pareto, and after him Pietri-Tonelli, make much of a distinction between "incomplete," "limited," or "imperfect" competition on the one hand, and on the other "complete," "unlimited," or "perfect" competition." We soon discover, however, that by such a terminology a monopolist can be operating under conditions of perfect competition." In fact, the "imperfection of competition" has nothing to do with the monopolistic or competitive character of the market, but refers to the conditions of production and the shape of the cost curve; surprisingly enough for the reader who has seen Mrs. Robinson's imperfect competition emerge from a discussion of decreasing costs, the Paretian imperfect competition is linked not with decreasing, but with increasing costs."

Under these circumstances, it is not surprising to find so far in economic literature no realization of the fact that the essential of monopolistic competition theories are already present

"Cournot, Chapter VII, pp. 79-85.

"L. Walras, *Eléments d'Economie Politique Pure* (Edition définitive, Paris, 1926), §§ 41 (also in Walras's, see p. 89), pp. 49-101

"V. Pareto, *Manuel d'Economie Politique* (Edition, Paris, 1927), pp. 159-171, pp. 314-315 and "Manuel", A. de Pietri-Tonelli, *Traité d'Economie Rationnelle* (Paris, 1927), pp. 116-122 and 155-160, pp. 92-1 below as "Pietri-Tonelli"

"Pietri-Tonelli, p. 155: "S'agira pas être en état de produire ou ... qui opère ... à l'état de produire ... sol état de marchandises produites par la concurrence complète"

"Cf. Note appended to this chapter, pp. 56-60.

in the Paretian analysis. We shall find them, however, not under the name of monopolistic or imperfect competition, but under the name of monopoly pure and simple.

A. THE SETTING OF THE PROBLEM

1. *The Blending of Monopoly and Competition*

Professor Chamberlin characterizes monopolistic competition as a theory that "concerns itself not only with the problem of an *individual* equilibrium (the ordinary theory of monopoly), but also with that of a *group* equilibrium (the adjustment of economic forces within a group of competing monopolists, ordinarily regarded merely as a group of competitors)." [69] It is the second aspect, *i.e.*, the "competitive interrelationships of groups of sellers," that distinguishes monopolistic competition from the traditional theory of monopoly.

Such a contrast is perfectly valid so far as Anglo-Saxon theory is concerned. Marshall's discussion of monopoly investigates exclusively the profit-maximizing problem of the isolated monopolist.[70] Pareto, however, in opposition to Marshall, does not isolate the monopolist from the rest of the economic system. On the contrary he admits the monopolist into his general system of equations side by side with all the other sellers in the economy, no matter whether these be also monopolists or simply competitors.[71] Like Professor Chamberlin's theory of monopolistic competition, the Paretian theory of monopoly supplements the analysis of individual equilibrium with a study of a group equilibrium. The difference is in the general method used. While monopolistic competition, an offspring of particular equilibrium economics, stops its study of competitive interrelationships at the boundary of a more or less homogeneous industry or group of producers, the Paretian system of general equilibrium pretends to embrace the competitive interrelationships throughout the entire economic collectivity.[72]

[69] Chamberlin, p. 69.   [70] Cf. below, pp. 130–131.
[71] *Manuel*, pp. 613–617.
[72] On the deficiencies and the oversimplification of Pareto's solution, however, cf. below, pp. 70–73.

2. *The Differentiation of the Product*

The greater "realism" of monopolistic competition assumptions, as opposed to the purely competitive setup, lies in the recognition of the phenomenon of product differentiation (this term will be preferred to the vaguer term used by Mrs. Robinson: market imperfection). The same phenomenon is explicitly described and taken into account by Pareto. He insists that incidental circumstances of credit, sales service, etc. may differentiate two commodities, identical in other respects: "ensuite il y a les cas très nombreux dans lesquels la marchandise Y, qui en apparence est la même, se divise en réalité en plusieurs marchandises. Ainsi, une dame un peu élégante ne se fait pas habiller dans les grands magasins; elle a recours a une couturière. Il y a des circonstances accessoires, de crédit, de certains soins donnés a la clientèle, etc., qui peuvent différencier des marchandises, du reste identiques." [73] The instances cited are similar (although the enumeration, merely exemplative, is somewhat shorter) to the ones by which Professor Chamberlin illustrates his case of "product differentiation" and Mrs. Robinson her "imperfection of the market." [74]

B. ITS SOLUTION

1. *Individual Equilibrium*

Like Professor Chamberlin,[75] Pareto recognizes the fundamental identity of purpose of the monopolistic and of the competitive seller: both of them are bent on maximizing profit: "Qu'il s'agisse d'un cas de libre concurrence, ou de monopole, tout individu tâche d'obtenir le plus grand gain possible." [76]

The individuals, however, may be more or less restricted in this endeavor. And here arises the distinction between type I and type II behaviors. If the individuals "accept the market prices as they are, and do not try to modify them directly,

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[73] *Manuel*, p. 602. Incidental recognition of product differentiation is not rare in economic literature (cf. Chamberlin, p. 69, n. 2). The merit of Pareto is in his integration of the case into his general analysis of equilibrium.

[74] Cf. above, pp. 40–41.   [75] Chamberlin, pp. 15–16.

[76] *Manuel*, pp. 663–664.

although they modify them indirectly without aiming at it or without knowing it," we are dealing with type I, *i.e.*, with a competitive situation. People acting according to type II "can and are consciously trying to modify directly these prices." [77]

What is type II behavior, then, but the behavior of Mrs. Robinson's or Professor Chamberlin's monopolistic competitor, maximizing profit on the basis of a negatively inclined sales curve? The analysis proceeds along similar lines, and comes to identical conditions of equilibrium, although the phrasing is outwardly different. Pareto happens to pick out price rather than quantity as the independent variable, and he does not bother to bring out explicitly the equality between marginal cost and marginal revenue, implicit in the profit maximizing condition.[78] However, his conditions of equilibrium for the enterprise have clearly the same content as Chamberlin's and Robinson's conditions.

2. *Conditions External to the Firm*

One might be tempted to compare the monopolistic competition discussion of group equilibrium with the Paretian analysis of the equilibrium conditions for a group of monopolists, each of which is selling a differentiated commodity.[79] In fact, however, the paragraph devoted to this matter by Pareto comes down to an unconvincing argument in favor of the determinateness of equilibrium. This argument is based on the implicit and unwarranted assumption that product differentiation entirely isolates the markets of the various sellers from one another. I shall come back to this later.[80]

The conditions of equilibrium external to the firm must be

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[77] V. Pareto, "Economie Mathématique," *Encyclopédie des Sciences Mathématiques* (Paris, 1911), Tome I, Volume IV (quoted below as "*Economie Mathématique*"), p. 623 (translation mine); also pp. 602–603 and *Manuel*, pp. 163–167, 209–210, 287–288, 329–330, 564, 594, 662–664.

[78] Pareto considers also the alternative possibility that the monopolist maximize, not monetary profit, but ophelimity: *Manuel*, pp. 594–595 and 616–617; cf. also Pietri-Tonelli, pp. 236–240 and 273–280.

[79] *Manuel*, pp. 598–599 and *Economie Mathématique*, p. 633. Explicitly, only the case of two sellers is discussed, but the extension to any number of sellers does not require any change in the reasoning.

[80] Cf. below, pp. 70–73.

looked for in the general system of equations determining the equilibrium, not of an isolated group of sellers, but of the whole collectivity. The equations determining an equilibrium position for the individual monopolists are supplemented by the other sets of equations which have to be simultaneously valid if a state of general equilibrium is to be reached.

Apparently the similarity between monopolistic competition and Paretian monopoly does not go further than this. Particularly, in opposition to the general tangency condition of Mrs. Robinson and to Professor Chamberlin's tangency condition for the large group under free entry, Pareto constantly associates monopoly with monopoly profits, and even makes this, at times, a criterion for distinguishing monopoly from competition. I think that the difference is partly a terminological one. Pareto is still wavering between the traditional concept of monopoly in terms of closed entry and his suggested definition in terms of a downward sloping sales curve. I shall come back in Chapter V to the relationship between the Paretian, the Chamberlinian and the Robinsonian theories of profit.

5. SUMMARY AND CONCLUSIONS

This first chapter has tried to restate, as they stand at present, the theories of monopolistic or imperfect competition in a form that will lend itself more readily to comparisons and criticism.

Four representative works have been selected for the task.[81] We have found the four of them treating the same problem; but approaching it with very different tools, and coming to results that coincide only in part.

The exposition has been confined mostly to a sheer restatement, although sometimes in a very altered form, of the positions of the writers examined. Criticism has been only

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[81] No French work is included. So far as I know, no book has as yet been published on the subject, in France, and only one article (exclusively popular) has appeared in a French periodical: I refer to Mlle L. Ballande "Entre la concurrence et le monopole," *Revue d'Economie Politique,* LII (1938), 65–99. This had been preceded by P. Fontigny, "L'Equilibre économique dans l'hypothèse d'une concurrence imparfaite," *Bulletin de l'Institut des Sciences Economiques,* Université de Louvain, VII (1935), 3–36.

occasional and directed mainly toward some special aspects (the Chamberlinian solutions of small numbers, for instance) which will attract little attention in the rest of this study.

The ground is now cleared for a general evaluation and criticism of the common body of doctrine uncovered in this first chapter. Thus, the next chapter will try to determine in what directions modifications and reconstruction are most obviously and urgently needed.

NOTE ON PARETO'S "INCOMPLETE COMPETITION"

Pareto and, after him, Pietri-Tonelli discuss a situation which they define as "incomplete," "limited," or "imperfect" competition.[82] This, however, has nothing to do with imperfect competition in the modern sense of the word. The contrast drawn by these writers between complete or perfect competition on the one hand and incomplete or imperfect competition on the other, rests on an entirely different basis, so different indeed that they actually go so far as to discuss the case of a firm's monopoly over commodities produced under perfect competition.[83]

The Robinsonian theory of imperfect competition developed from a discussion of the logical difficulties implied in the association of pure competition with decreasing costs. By a strange paradox, the Paretian analysis defines competition as incomplete when marginal costs are increasing, as complete when they are decreasing. Competition is called "complete" in the latter case for the very reason which prevented English economists from reconciling competitive equilibrium with decreasing costs: when costs are decreasing the rules of profit maximization induce the firm, not to limit its production at a certain level, but to expand it indefinitely. In the opposite case, when increasing marginal costs limit the size of the profit maximizing output, Pareto

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[82] *Manuel*, pp. 185–207; Pietri-Tonelli, pp. 119–122, 150–160. This whole note on "incomplete competition" is only of historical interest. It is in no way necessary to the understanding of the following chapters.

[83] Cf. Pietri-Tonelli, p. 159: "Supposons que ce soit le producteur 2 qui opère sous condition de monopole. . . . S'il s'agit de marchandises produites par la concurrence complète. . . ."

considers that competition is "incomplete": each producer finds it advantageous to limit his supply.

How does Pareto solve the equilibrium problem in each of these two cases?

A. MONOPOLY

Under complete as well as under incomplete competition, the individual firm aims at maximizing profit.

(1) When competition is incomplete, that is, when marginal costs are increasing, this aim of the monopolistic seller can be. reformulated in the familiar condition that marginal cost equals marginal revenue. Pareto, however, uses a more cumbersome expression making use of a "ligne du profit maximum" defined as the locus of the points, on various possible total revenue curves, at which these curves have the same slope as the unchanging total cost curve of the firm.[84] In other words, the curve of maximum profits corresponds to the locus of the points of intersection between the curve of marginal cost and the various curves expressing all possibilities as to marginal revenue. It would seem that, in order to derive equilibrium in any concrete case, all we have to do is to discard all the irrelevant revenue curves and consider, on the curve of maximum profit, the point corresponding to the actual revenue curve. Pareto, however, forgets his previous definition of the curve of maximum profit and defines equilibrium by the *tangency* of this curve with the curve of total revenue.[85] This, of course, makes no sense, which does not deter the faithful Pietri-Tonelli from reproducing the same formulation of the conditions of equilibrium; a diagram is even supplied where curves are drawn in a perfectly fantastic manner in order to exhibit the impossible tangency.[86]

(2) If the monopolist produces under conditions of complete competition (decreasing marginal cost) the intersection of marginal cost and marginal revenue might express a position of

[84] *Manuel*, p. 187.
[85] *Manuel*, p. 207. The "ligne des échanges" may be understood here as the curve of total revenue.
[86] Pietri-Tonelli, p. 160.

minimum, rather than maximum profit. Pareto varies accordingly his formulation of the equilibrium condition; it is now expressed as the tangency of the total revenue curve with the highest "profit-indifference curve" of the firm. In the usual case where the firm maximizes profits measured in money, each profit-indifference curve is defined by the equidistance of all its points from the curve of total cost. In other words, each profit-indifference curve indicates, corresponding to each possible output, the total revenue which would give the firm the same amount of profits.[87] The highest profit-indifference curve is thus the one that is the farthest above the cost curve, *i.e.*, the one for which the *positive* difference between total revenue and total cost is maximized. In this way, Pareto takes care that the equilibrium position correspond to maximum, not to minimum, profits.

B. FREE COMPETITION

The introduction of free competition (implying pure competition plus free entry) modifies the conclusions reached for the case of monopoly (closed entry).

(1) The incompatibility between competitive equilibrium and decreasing costs to the firm has long been known to Anglo-American theory. Pareto is aware that every competitive firm, under complete competition, tends to expand output indefinitely without reaching any true equilibrium position. This general expansion, however, cannot proceed beyond the no-profit point; when it does, it is immediately stopped due to the fact that the firms find themselves in the red. It is not quite clear from Pareto's exposition whether this limitation of the total output of the competing sellers is reached through a spontaneous limitation of output by every individual firm or through a continuous expansion of output by some firms, compensated by the bankruptcy and disappearance of others. Neither of these

[87] The technique of profit-indifference curves, or, as he calls them, of "equal-profits" lines, has been recently rediscovered and applied by Mr. R. H. Coase. There is no indication that the writer is aware of the previous use of the method by Pareto. Cf. R. H. Coase, "Some Notes on Monopoly Price," *Review of Economic Studies*, v (1937), 28–30.

solutions takes into account all the terms of the problem, *i.e.,* the attainment of an equilibrium position by the individual sellers, under competitive conditions.[88]

(2) No such difficulty exists under conditions of incomplete competition (increasing marginal cost). Each producer limits his output to the level corresponding to the condition of equilibrium indicated above in the monopoly case. But, in addition to this, free entry of firms must ultimately eliminate profits and, in this case as in the preceding one, drive the producers on to the "ligne des transformations complètes" (no-profits curve).

Modern Anglo-American theory formulates these problems far more elegantly and solves them in a more logical way. Pareto's own account is difficult to follow, owing to its awkward technological and terminological apparatus. Moreover, the matter is further confused by the artifice of considering only two exchangers (one seller and one buyer), and imagining that they behave as though they were many.[89] The entire argument is both obscure and unsatisfactory. It is noticeable that in the "Appendix" no mention is made of it.

[88] This logical inconsistency appears also in Professor Pigou's discussion of the case in the Appendix to his *Economics of Welfare* (3rd edition, London, 1929), Appendix III, pp. 787-812.
[89] *Manuel,* p. 189.

CHAPTER II

GENERAL EVALUATION AND CRITICISM OF MONOPOLISTIC COMPETITION THEORIES

THE monopolistic competition theory of value, as outlined in the previous chapter, already reveals a number of crevices that threaten sooner or later to split the whole edifice. An attempt will now be made to test, in each of our authors, three essential sectors of the theory: first, the definition of the sales curve used by the individual producer as a basis for his maximizing calculations; secondly, the treatment of the interrelationships between the firms; and thirdly, the definitions of groups, industries, commodities on which important parts of the theory (at least, in the particular equilibrium brands of monopolistic competition of Robinson and Chamberlin) are made to depend.

1. SUBJECTIVE OR OBJECTIVE SALES AND COST CURVES?

When attention is fixed upon the maximizing behavior of the individual unit or firm, it is clear that the only sales curve that is relevant is the "subjective" or "imagined" sales curve [1] which expresses the expectations of the producer as to the relationship between the price he charges and the quantity of his product the market will buy. It is with reference to this subjective curve that Pareto bases his distinction between type I and type II behaviors.[2] Similarly, Chamberlin's distinction between elastic and inelastic demand is indicated in subjective terms.[3]

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[1] The term "imagined" demand curve is used in opposition to the "real" demand curve by Mr. N. Kaldor in "Mrs. Robinson's Economics of Imperfect Competition," *Economica*, I (1934), 340–341, and in "Market Imperfection and Excess Capacity," *id.*, II (1935), 40, n. 1.

[2] Cf. especially *Economie Mathématique*, p. 623.

[3] Cf. Chamberlin, p. 7: For competition to be perfect, the number of buyers and sellers "must be large enough so that, even though any single individual has, in fact, a slight influence upon the price, he does not exercise it because it is not worth his while. If the individual seller produces on the assumption that his entire output can be disposed of at the prevailing or market price, and with-

The whole analysis of monopolistic competition, however, whether it be that of Chamberlin, Robinson, Stackelberg or Pareto, is conducted as if this subjective sales curve were merely the exact reflection of an objective sales curve, embodying the actual reactions of the market.[4] In this way, the distinction between a subjective and an objective definition of demand becomes irrelevant: no matter what the definition used at the start,[5] the same sales curve is interpreted as representing identically both the expectations of the seller and the happenings on the market.

Pareto does not raise the question at all, although his condition of profit maximization by the monopolist is based upon the tacit assumption of a price-quantity relationship identical to a sales curve. The curve must obviously be a subjective one, and the only part of it that coincides of necessity with the objective facts of the market is the point at which the firm happens to be actually selling at the moment. When a movement takes place, the seller, expecting to move along the imagined curve (and calculating an equilibrium position accordingly), may very well find himself led astray by his imagined curve. A new curve will then be "imagined," implying a revision of the equilibrium position and a new incentive to movement. All this is ignored by Pareto and the attainment of equilibrium is thereby greatly, but arbitrarily, simplified.

Mrs. Robinson shows some awareness of the problem. Indeed, it would be difficult for anyone to assume lightheartedly

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holds none of it, there is pure competition so far as numbers are concerned, *no matter . . . how much influence he actually exerts*" (italics mine). Cf. also p. 54.

[4] Professor Chamberlin recognizes the distinction explicitly in the case of small numbers, but nearly everywhere else he is apt to give indifferently an objective or a subjective content to his distinction between the horizontal sales curve of pure competition and the negatively sloping curve of monopolistic competition. I have just quoted passages in which the distinction is made unambiguously on a subjective plane. On other occasions, the distinction assumes an objective flavor by the use of a traditional, Marshallian definition of the sales curve as "showing the amounts of product which will be demanded . . . at various prices" (p. 12) and as "rigidly defined by the fixity of . . . *all other prices*" (p. 75).

[5] In opposition to Professor Chamberlin, Mrs. Robinson, e.g., defines clearly her sales curve in an objective sense: cf. Robinson, p. 21.

that every entrepreneur knows the "full effect upon the sales of . . . [his] firm which results from any change in the price which it charges, whether it causes a change in the prices charged by the others or not." [6] And this is what Mrs. Robinson's definition of demand expects of him. On page 56, however, she admits that "even the most up-to-date businesses have only the vaguest notion of what kind of demand curves they have to deal with." After this admission, her only suggestion is that the seller may be conceived to equate marginal revenue to marginal cost "either by estimating the demand price and the cost of various outputs, or by a process of trial and error" (p. 52); and that "if the conditions of demand and supply remain constant over a fairly long period, the monopolist will be able to hit upon the exact monopoly output . . ." (p. 56); and she refers to the fact that a complete knowledge of market conditions thus becomes possible.

Professor Chamberlin is not more explicit. He points out, in his discussion of small numbers, the "uncertainty as to the response of competitors, which . . . would make it uncertain whether *indirect* influence would be regarded," [7] but he never investigates the way in which the entrepreneur ascertains what his *direct* influence on price is. Even when the level of general prices varies widely (as, *e.g.*, on pp. 91–92), the seller is supposed to know immediately at each new level what the new dd' is: *i.e.*, what he could sell at various prices if the other sellers went on selling at the new level of prices just reached. [8] We would feel more comfortable about this if we were sure that the "*elasticity* [of dd'] may . . . without sensible error, be taken as the same regardless of position, since it expresses the preference of buyers for the 'product' of one seller over that of the others. There seems to be no especial reason why this should

[6] Robinson, p. 21.
[7] Chamberlin, p. 101 (italics mine).
[8] Such a knowledge would appear even more unlikely if it were not for the "short-cuts of exposition" which make for a common level of price for all firms in the group; and which veil the problem whether the impact effect of the others' actions is registered by the individual firm in a change of its price or in a change of the quantities disposed of, price remaining unchanged.

be stronger at higher than at lower prices, or vice versa."[9]
Unfortunately, the evidence seems rather meager to warrant
the conclusion.

By revealing the complexities of the firms' interrelationships,
Stackelberg has shown the task of the entrepreneur to be even
more formidable than we suspected. But, like Mrs. Robinson
and Professor Chamberlin, he assumes that the workings of the
market will soon bring about a revision of any mistake in the
entrepreneur's subjective estimates, so as to make them coin-
cide with the objective facts that determine which strategy will
make for larger profits.

The problem, let us remark, is not confined to monopolistic
or imperfect competition. In pure competition it is simply
cloaked under the assumption that the sales curve is perfectly
elastic. Actually, such an assumption covers up a *double*
hypothesis: (1) that the entrepreneur has, in actual fact, no
influence on the price of the product sold; (2) that he takes
price as a parameter in his calculations, *i.e.*, that he estimates
correctly his influence (in this case nil) on the price of the
product.[10]

Now is it true that the workings of the market would elimi-
nate rapidly any discrepancy between the objective and the
subjective sales curves? If the first were supposed never to
shift, the entrepreneur would revise the latter any time the
results actually obtained failed to correspond with the antici-
pated results derived from the subjective sales curve. The price
of the product, however, is exposed to two kinds of influences:
those that are controlled by the entrepreneur (reduced here to
the amount offered for sale), and those over which the entre-
preneur has no control and which he considers as parameters.
When the objective relationship between price and output is
shown by the market not to coincide (for one point of the

[9] Chamberlin, p. 90, n. 1. On the graphs, however, what appears to remain
constant is not the elasticity, but rather the slope of dd'.

[10] A similar problem arises in connection with the supply curve of factors
to the firm. The assumption of such curves (just as necessary as the sales curve
to calculate a position that maximizes profit) again mixes two questions: first,

curve) with the subjective relationship assumed, the entre-
preneur is at a loss to know whether the discrepancy is due to
any mistake in his estimate of the *slope* of the curve, or rather
to a change in the parameters, and a consequent *shift* in the
curve's position. It must be noted that in many cases these
parameters of shift are not directly known to the firm: in the
large group case of Chamberlin, *e.g.*, there is no *a priori* reason
for the seller even to know *who* his competitors really are, since
he never feels their competition in isolation. He will, of course,
get hints about it from such facts as locational proximity, physi-
cal similarity of the products, etc. . . . but this is only indirect
and vague. If, from the large group we come down to the real
world, some of this uncertainty will disappear, but it will be a
rare case when a firm knows exactly and entirely who its com-
petitors are, and thus what variables it has to watch as con-
stituting for it parameters of shift.

In a dynamic economy such uncertainties are the common
rule and any discrepancy between the real and the imagined
curves cannot be dismissed summarily as being a mere accident
of no, or of only ephemeral, significance. The investigation of
this problem, however, would lead into problems of expecta-
tions and business fluctuations foreign to the framework of
static equilibrium economics within the boundaries of which
the present analysis is confined.[11]

But it must be recognized that the usual statement of equilib-
rium conditions is valid only when the entrepreneurs succeed
in gauging correctly the shape of their sales curves. If such is
not the case, their mistake may very well introduce disequilib-
rium into a situation which would, otherwise, have been in
equilibrium; or (probably a more frequent occurrence) it may
create stability in cases where conditions for general equilibrium
would not be fulfilled if the shape of demand had been correctly
estimated. Similarly, the entrepreneurs' errors in estimating

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the real influence (or absence of it) of the firm on the price of factors bought,
and secondly the producer's subjective estimate of this influence.

[11] For a short discussion in static terms, cf. R. H. Coase, "Some Notes on
Monopoly Price," *The Review of Economic Studies*, v (1937), 17-31.

the shape of the supply curves of the factors they use may result in stability or introduce disequilibrium where, had correct estimates been made, there would have been, respectively, disequilibrium or stability.

2. THE TREATMENT OF THE INTERDEPENDENCE OF THE FIRMS

A. GENERAL OR PARTICULAR EQUILIBRIUM?

By breaking up the Marshallian "industry" into individual firms, each of which has to solve for itself its own equilibrium problems, Professor Chamberlin and Mrs. Robinson could approach a problem largely neglected by particular equilibrium theory: the problem of the competitive interrelationships between the firms.[12]

But even Professor Chamberlin and Mrs. Robinson confine their analysis to the equilibrium of the group or industry.[13] Nowhere do we find any discussion of the relationships *between* the groups. Such a discussion would, by definition, step over the boundaries of particular equilibrium and take us into the wider realm of general equilibrium economics. Faithful to particular equilibrium traditions, Mrs. Robinson and Professor Chamberlin stop their analysis when equilibrium is established within the group or industry.

These boundaries exist neither for Stackelberg nor for Pareto. Both discuss the problem of firms' competition in its full generality, within the framework, not of the group, but of the whole economic collectivity.

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[12] It may seem strange to hear that the central problem of "competitiveness" is largely neglected by the traditional competitive theory. The reader may convince himself by going back to Marshall's *Principles* and studying, for instance, the treatment of the supply curve. Nowhere is the industrial supply ("how much of the commodity will be forthcoming at such and such a price") related to the concrete decisions of the individual firms composing the industry. In the Marshallian analysis, competition between the firms is not analyzed further than the statement that no firm can sell any amount of product at a price above the one charged by its competitors.

[13] The last chapter of Mrs. Robinson's book, "A World of Monopolies" seems to constitute an exception, but really discusses problems of a different nature. As Mrs. Robinson warns us in her Introduction (p. 11), "we are no longer occupied with the Theory of Value, and have stepped over into the province of the Economics of Welfare."

We can, however, ignore for the moment this first and essential difference between the four writers previously reviewed, and discuss their theories on the ground common to all of them: the interdependence of the firms within a group or industry.

B. MRS. ROBINSON'S CIRCULAR SOLUTION

Mrs. Robinson's handling of the interdependence of the firms is the most obviously unsatisfactory: not only is the solution unacceptable, but the setting of the case is so devised as to dodge the fundamental difficulty. Her definition of the sales curve actually juggles away the whole problem of competition between firms. The entrepreneur is supposed to know the ultimate consequences of any change in his price-output policy, whether the change brings about any reactions among his competitors or not. When the curve embodying this knowledge has been drawn, there is no more need for the firm to care about the existence of rival producers: maximization can proceed and a final level of adaptation be reached on the basis of this Robinsonian sales curve. By the simple virtue of definition, profit maximization by the firm automatically takes care (but in a way which remains unanalyzed) of all other reactions in the economy.

Mrs. Robinson's sales curve, however, would not be as objectionable if it merely ignored momentarily a problem by assuming it to be solved. The method has often been used by Cambridge economists and, though ticklish, cannot be condemned *a priori*.[14] But the question is: does such a curve exist? is it theoretically possible to construct it? Or, to use Bridgman's criterion,[15] can it be given an operational definition?

Now, in so far as it embodies only a *subjective* meaning, it is clear that such a curve always exists. Each producer, if he tries at all to maximize profits, has, in Mr. Kaldor's words, to "base his policy upon certain ideas concerning the relation between the demand of his product and its price."[16] In this

[14] Cf. W. Leontief, "Implicit Theorizing: A Methodological Criticism of the Neo-Cambridge School," *Quarterly Journal of Economics*, 11 (1937), 337-351.
[15] P. C. Bridgman, *The Logic of Modern Physics* (New York, 1927).
[16] N. Kaldor, "Market Imperfection . . . ," *Economica*, II (1935), 33, n. 1.

sense a sales curve must exist and, moreover, should be defined in the Robinson manner so as to describe the final results of the entrepreneur's moves, and not merely the results that will come about as long as competitors do not react; for it is obviously the *total* influence on price that is relevant for his calculations.

But the curve of the monopolistic competition theorists is also supposed to be an *objective* curve embodying the actual relationships between one seller's price and output, as worked out on the market. It is with respect to this objective curve that we must now repeat the question: is it possible to give meaning to Mrs. Robinson's definition of the sales curve?

Two cases are possible. In the first place, we may assume that the seller has no influence, or only a negligible influence, on the other sellers, so that these do not, in fact, react to the first one's moves. In this case, Mrs. Robinson's curve is no different from that of Marshall and Chamberlin and we may reserve the discussion until we come to the latter's procedure. Secondly, we may find that such reactions do actually appear and that any move by one seller induces other sellers to readjust their position, thus reflecting back on the ultimate effects of the first seller's move. Here Mrs. Robinson's sales curve assumes a specific meaning, quite different from the Marshallian type of demand curve, constructed on the basis of unchanging prices of the other sellers. Unfortunately, when Mrs. Robinson's sales curve differentiates in this way from the Marshallian curve, it can be shown that its definition is based entirely upon a circular reasoning. To define seller A's sales curve, we must know the reactions of his rival B, *i.e.,* not only the influence of A's move upon B's position, but also the way in which B will adapt himself to the change in his situation: for this, we must know B's sales curve. But again to know B's sales curve, we must know the sales curve of A. This leaves us in a logical circle, and Mrs. Robinson does not provide the way out.[17] In fact, she proclaims

[17] Cf. H. von Stackelberg, *Marktform und Gleichgewicht*, p. 87, and "Neues Schrifttum über unvollständigen Wettbewerb," *Schmollers Jahrbuch*, LIX (1935), 707; also N. Kaldor, "Mrs. Robinson's Economics of Imperfect Competition," *Economica*, I (1934), 340-341.

she is not even interested in the question. After having given her definition of the sales curve, she adds: "It is not to our purpose to consider this question in detail. Once the demand curve for the firm has been drawn, the technique of analysis can be brought into play, whatever the assumptions on which the demand curve was drawn up." [18] This faith in the virtues of pure technique applied to undefined concepts prevents Mrs. Robinson not only from solving, but even from comprehending the nature of the problem to be tackled.

C. THE GAP IN PARETO'S SYSTEM

I wish to introduce the following distinction with regard to Pareto's treatment of the interdependence of the firms. On the one hand, in contrast to Mrs. Robinson, Pareto recognizes the logical difficulty implied in the oligopolistic interdependence that may exist between the sellers. But on the other hand, he fails to realize the full generality of the phenomenon, and develops his main analysis on the preposterous assumption that the slightest degree of differentiation suffices to eliminate all oligopoly elements from the interrelationships between the firms.

The root of the difficulty, in the case of oligopolistic interdependence, may be stated as follows: if a seller has such an influence upon one or several competitors that his own price-output decisions are capable of influencing the price-output decisions of this, or these, competitors, this influence will be a factor to be taken into account in his profit-maximizing calculations. This would not be so troublesome if this influence were perfectly definite, the other sellers taking passively the decisions of the first as parameters of action. But the other sellers may also have an influence on the first one, and will then try also to take advantage of it to induce him to take some price-output decision favorable to their own interests. It is this mutual, but indecisive, influence that opens the door to an infinitely varied pattern of possibilities. The oligopolists may be afraid of unleashing unpredictable reactions, and are thus

[18] Robinson, p. 21.

frozen into a policy of routine and immobilism. Or, on the contrary, they may feel in a fighting spirit and launch an undercutting policy in the hope of ruining their rivals and of driving them out of the field. Or again, they may accept, tacitly or expressly, unreservedly or only within some more or less definite range, the lead of one of them and abstain from price competition. Any number of tacit agreements are conceivable (partition of the market according to various criteria, limit to advertising expenditure, etc.), and any amount of restriction on competition. If, as is usual, price competition is barred, other types of competition may or may not be preserved: competition with respect to service, to advertising, to pressure upon governmental agencies to obtain big orders or tariff favors, etc.[19] No doubt, there is a sense in which the solution is always determinate: it all depends on the number of variables that are considered. But it is clear that the variables that would have to be added to determine the solution might be of a very different type from the ones generally used by pure economics of the equilibrium brand. Such considerations as financial backing, political influence, prestige psychology, optimistic or pessimistic slant, enterprising or routine-like attitude in business, etc. may well play an overwhelming role in determining the solution.

This is clearly perceived by Pareto in what seems to me the essential passage in his analysis of duopoly. I quote it at length because Pareto's name, in connection with the duopoly problem, is generally associated with other suggestions of his, while this feature of his discussion is often neglected, owing probably to its unassuming, non-mathematical aspect:

Il est oiseux de demander à l'économie pure ce qui arrivera si deux individus ayant le pouvoir d'exercer un monopole par la vente d'une seule

[19] A very good example of the different ways in which oligopolistic situations may develop is provided by the history of railroads in the United States and in Great Britain: while a fierce price competition was the rule in the first country, the competition of British companies came rather soon to be limited mostly to the quality of service provided. The latter type of competition is also apparent today in the United States in the field of gasoline retailing. A most comprehensive discussion is to be found in A. R. Burns, *The Decline of Competition* (New York, 1936).

et même marchandise se trouveront en présence. L'économie pure, en nous faisant savoir qu'il est impossible que ces deux individus usent en fait de leur monopole, agissent tous deux selon le type II, a répondu tout ce qu'elle pouvait nous dire. *C'est à l'observation des faits* de nous apprendre le reste. (Italics mine.)

L'économie pure ne peut même pas nous dire que les deux individus feront indéfiniment la navette entre deux positions extrêmes d'équilibre. Cela ne résulte nullement de ce que l'équilibre est déterminé par deux équations incompatibles.

Encore moins faut-il s'imaginer que l'observation des faits va nous conduire a une solution unique. Au contraire, il y en a une infinité.

Il y a d'abord les cas très nombreux et très variés dans lesquels les deux monopoleurs *en puissance* se réduisent à un monopoleur en fait. Si les deux monopoleurs se mettent d'accord, il n'y en a plus qu'un. Les *cartels*, les *trusts*, etc. . . . nous font connaître bien des manières de réaliser cet accord. De même il n'y en a plus qu'un si le second monopoleur accepte les prix fixés par le premier, qui alors agit seul selon le type II. . . .

Enfin le but du monopoleur 1 peut être de ruiner son concurrent 2; ou bien, au contraire, de lui permettre de vivoter, pour ne pas le pousser à courir les chances d'une lutte à outrance. Il y a une infinité d'autres circonstances de ce genre, qui toutes changent la nature du problème proposé.[20]

Notwithstanding these rather discouraging conclusions, Pareto proceeds to build up his system of general equilibrium with merely the help of a very tiny box of assumptions, none of which makes any reference to the difficulties just raised. The transition from indeterminateness to determinateness is provided (in a very abrupt way) by Pareto's discussion of the case of the "monopole de deux individus et de deux marchandises." The gist of this paragraph is that, when the commodities sold by the two monopolists are differentiated, even if only slightly, all the indeterminateness disappears: each monopolist maximizes profit in a perfectly autonomous way and ignores the reactions of the other seller.[21] The problem is no longer treated as a problem in duopoly, but simply as two isolated monopoly problems.

Such a cleavage appears to be perfectly unwarranted. A slight degree of differentiation is not enough to isolate the two sellers completely. Pareto seems to be led astray here into a

purely terminological solution of the difficulty. The mere fact that instead of speaking of one commodity, we can now speak of two commodities does not cut all the links between the two sellers.[22] There is between the two extreme cases of perfect interdependence (the "one-commodity" case) and perfect isolation, a long series of intermediate possibilities, taking us gradually from one extreme to the other. The Paretian procedure of completely isolating the two sellers cannot be legitimately extended to the whole of that intermediate zone.[23]

The failure to solve correctly the problem of oligopolistic interdependence in the case of product differentiation, or rather the unwarranted assumption that product differentiation suffices to chase all oligopoly elements out of the picture, affects the validity of the whole ensuing system of general equilibrium equations. The simple and pure economics of general equilibrium can be applied only, according to Pareto's own argument, when oligopolistic relationships are excluded. If product differentiation is not a sufficient guarantee in this respect, we must either introduce additional assumptions that will determine the solution of oligopoly, or restrict the analysis to such cases where the oligopolistic difficulty does not appear. The first procedure is adopted by Stackelberg. Professor Chamberlin makes use of the second in his segregation of the large numbers case.

D. THE FANCIFUL SOLUTION OF STACKELBERG

In contrast to the three other authors, Stackelberg concentrates the best of his efforts on that very problem of the indetermining influence of oligopoly on the equilibrium solution. This may be considered his specific contribution to the general body of monopolistic competition theories. Although

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[22] Nowhere does Pareto discuss the basis for defining a commodity. If he had faced the problem squarely, he would have perceived the importance of *substitutability* and the *gradual* transition which differentiation may introduce between the one-commodity case (perfect substitutability) and the case where the sellers are perfectly isolated from one another.

[23] Cp. F. Y. Edgeworth, *Papers relating to Political Economy* (London, 1925), vol. I, p. 121: "the extent of indeterminateness diminishes with the diminution of the degree of correlation between the articles."

making stimulating suggestions, his treatment is not convincing. We shall find, first that his original solution of pure (*i.e.*, without differentiation of product) oligopoly is sheerly arbitrary; secondly, that he overlooks completely the "determining" influence of product differentiation on the derivation of equilibrium.[24]

1. *Pure Oligopoly*

The psychology of Stackelberg's duopolists is rather puzzling. Their only ambition is to persuade their rival to accept either the position of leader, or the position of follower, depending upon which of the two is more favorable to their own interests. Their only strategy to achieve this purpose is to play a kind of poker game, bluffing the rival into believing that, for their part, they are immovably determined to stick at all costs to the preferred position, and that the rival had better resign himself to the correlative position.

The weakness of this solution lies in the arbitrary limitation of the duopolists' ultimate aim, and of the means by which they try to achieve it. The first limitation is probably the more unreal. Instead of abiding by the rules of Stackelberg's game and, for instance, losing a little money during a period of indefinite length, the duopolist might throw all his resources at once into the battle, impressing upon the rival his own determination to undercut him systematically, whatever the cost might be. This might discourage the other seller more rapidly and persuade him to quit the field entirely, securing for the first duopolist a greater advantage at possibly smaller cost. Stackelberg's duopolists are merely playing a rather silly game, the rules of which have no other *raison d'être* than the caprice of the author.

The same criticism applies, with more strength, to Stackelberg's analysis of pure oligopoly. The network of possible positions now becomes so intricate that no seller could ever succeed: first in finding out what position would be the more

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[24] His mistake should be contrasted with the overconfidence in the "determining" effect of differentiation found in Pareto.

favorable to him, and secondly in bluffing all the rivals into the exact niches in which they are respectively wanted. Bluffing them out of the field would indeed appear a less formidable task to attempt.[25]

The apparent realism of Stackelberg's solution comes from the fact that, in opposition to Chamberlin, Robinson and Pareto, he suggests an *asymmetrical* situation of market leadership. In the real world, however, such a phenomenon would hardly be the outcome of a theoretical computation, by the sellers, of the respective advantages of the leadership position and the position of "follower." More often, it will result, quite simply, from a direct recognition of the comparative importance and means of action of the firms in the field.

2. Product Differentiation

The conclusions of Stackelberg with respect to product differentiation are definitely one-sided. We have seen that for him the main result of differentiation is to increase the number of possible solutions. But differentiation of the product may be viewed from another angle: it makes it possible to define conditions under which we can escape the logical circle created by the mutual interdependence of the firms.

When the product is homogeneous, it would be contradictory for a seller to assume at the same time that he has an influence on price (that his sales curve is sloping) and that he has no significant influence on the other sellers. Price being, as a result of homogeneity, identical for all, he influences the price of his rivals in exactly the same measure as he influences his own price. The admission of heterogeneity between the products of the competitors tends to lessen the degree of interdependence. We can view at the two extremes the two limiting cases of perfect homogeneity on the one hand, and perfect heterogeneity on the other. In the first case, a small cut in *one* price, the others remaining unchanged, would draw toward the firm that has cut the price all the customers of the rival firms selling

[25] A special case in which the interests of the duopolists would be compatible is suggested by W. Leontief, in "Stackelberg on Monopolistic Competition," *Journal of Political Economy*, XLIV (1936), 554.

the same product. In the opposite case of perfect heterogeneity, a small cut in *one* price, the others remaining constant, would make equal incursions into the markets of all the other firms in the system, so that the impact on any of them may become negligible. This, as we have seen, corresponds precisely to one aspect of Professor Chamberlin's "symmetry assumptions," and leads him directly to his isolation of a "large group" case, free from oligopolistic indeterminateness. To this I will come presently.

E. CHAMBERLIN'S ELIMINATION OF OLIGOPOLISTIC INTERDEPENDENCE

I have already discussed at length the particular framework of assumptions on which Professor Chamberlin's solutions of the small group case ("Oligopoly plus Monopolistic Competition") are based. I shall now leave that part of his theory aside, and concentrate attention on his isolation of what he calls "the large group case."

The first point to notice is that the sales curve used by Professor Chamberlin in connection with large numbers is perfectly free from any objection on the score of circularity: the sales curve shows the relationship between demand and price for a given product, the prices of all other products being kept constant.[26]

A sales curve so defined, however, can only be significant when it is legitimate to assume that the seller maximizes profit autonomously, *i.e.*, when he has no "indirect" influence to take into account, no rivals' reactions induced by his own price-output decisions. It is precisely such a situation that Professor Chamberlin attempts to isolate in his large group case.[27] In-

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[26] Stackelberg, who criticizes the circularity of Mrs. Robinson's definition, admits that Chamberlin's definition is unassailable. Cf. his article "Neues Schrifttum über unvollständigen Wettbewerb" in *Schmollers Jahrbuch*, LIX (1935), 707.

[27] Stackelberg ignores this distinction between large and small group, and attacks Chamberlin's equilibrium as a mere generalization of Cournot's solution, derived from the assumption that all economic units follow a policy of passive adaptation to each other. Cf. article referred to in last footnote, p. 706: "Das volkswirtschaftliche Gleichgewicht, wie es Chamberlin ableitet, kommt durch eine allgemeine Anpassung aller wirtschaftlichesindividuen aneinander und an

direct reactions are rightly ignored because "any adjustment of price . . . by a single producer spreads its influence over so many of his competitors that the impact felt by any one is negligible and does not lead him to any readjustment of his own situation."[28]

As set down by Professor Chamberlin, however, the definition of the large group is unnecessarily narrow: it is acceptable only within the framework of the symmetry assumptions which dominate the whole treatment of the large group case. In the general case, what-is relevant is not the influence of the firm under consideration upon the other firms in the group, but the double question: (1) Does such an influence exist? (2) If so, does the reaction of the firms affected influence in turn the first firm? Only if both questions are answered in the affirmative, will the firm, when deciding on policies, take account of its influence on others; on the contrary, if the second question were answered negatively, this influence on others would be of no concern to the firm and would not raise problems of oligopolistic circularity. Under the symmetry assumptions, Professor Chamberlin's formulation is correct, the answer to the first question containing, when the coefficient $\dfrac{\delta R_i}{\delta p_j}$ has the same value for all the firms in the group, the answer to the second question as well. To be useful, Professor Chamberlin's formulation needs be broadened beyond the realm of a hypothetical group of symmetrical firms.[29]

This isolation of the cases under which pure economics of

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die jeweils gegebenen Parameter zustande. Es ist deshalbe . . . im Grunde eine Verallgemeinerung der Cournotschen Lösung und ist damit allerdings den gleichen kritischen Einwendungen ausgesetzt wie Cournots berühmtes Theorem.".

Let us remark, first, that the passive policy of adaptation followed by Chamberlin's sellers could be termed a generalization of Edgeworth's solution as well as of Cournot's solution: indeed, the sellers act on the assumption that their competitors will maintain prices. Secondly, in the large group case, the policy of passive adaptation is the only one that is possible, the sellers having no indirect influence to take into account in their maximization calculations. As pointed out above (p. 52), Stackelberg himself suggests elsewhere the very solution he criticizes.

[28] Chamberlin, p. 83.
[29] Cf. below, pp. 101–102.

the traditional type can proceed with only the help of an extremely scanty set of assumptions, may be regarded as the most important contribution of the new theories to the clarification of the general theory of value. It is vital to any system of pure economics and should be introduced into the Paretian system in order to give validity to the equilibrium conditions there evolved. It undoubtedly accepts a loss of generality, a shrinking of the legitimate field for pure economics. It acknowledges the existence of a vast area closed to equilibrium economics of the pure, Walrasian or Paretian type. But who doubts that?

For the solution of these problems that lie beyond the borders of the large group case, additional assumptions must be borrowed to complement the traditional box of tools of pure analysis. Stackelberg's investigation constitutes an attempt of this sort. The unreality, however, of the additional assumptions which he decided to pick out, deprives Stackelberg's solution of any general significance. The assumptions will have to be carefully chosen, on the basis of empirical, factual investigations of present-day economic life. The unreal atmosphere which surrounds our current theories of oligopoly may be ascribed to the fact that the assumptions are too often chosen for their analytical convenience, rather than for their actual relevance to the real world of today.

3. The Concept of a Group or Industry

A. UNDER PURE COMPETITION

More than by anything else the logical structure of monopolistic competition theories has been marred by an uncritical reliance upon two vaguely defined concepts: the concept of a "group" (or "industry"), and the correlative notion of a "commodity" identically produced by all the firms in the group. The handicap is especially damaging to the particular equilibrium brands of monopolistic competition, which by definition have to lean more heavily on such groupings of firms and products.

These concepts were perfectly legitimate when used within

the compass of the purely competitive assumptions from which they originate. Under pure competition, a number of sellers were supposed to compete for the sale of a homogeneous, identical commodity: these sellers constituted a group, or an industry. What this homogeneity, or identity, consisted in was not made quite clear and explicit; the theorist rarely inquired into the matter and rested content with a "common sense" classification, vaguely based on the identity of name and on the physical similarity of the products.[30]

This sandy foundation, however, supported a heavy and magnificent superstructure: the classical theory of competition. The "industry" was made to serve a triple purpose: (1) to narrow down the problems of general competitiveness to an inquiry of more manageable dimensions; (2) to reduce to a standard and fairly simple pattern the infinite variety of competitive interrelationships; and (3) to provide a first and rough approximation to a profit theory.

From the whole congest of interrelated economic units, the industry abstracts those firms that are more tightly linked with the enterprise under consideration and which, as a consequence, cannot be ignored in a discussion of its problems. The competitive situation of the enterprise can, thus, be studied with sufficient precision without dragging into the picture the whole world of economic firms which, strictly speaking, compete more or less directly with the enterprise under study.

[30] Explicit statements are hard to discover; cf., however, F. H. Knight, *Risk, Uncertainty and Profit* (Boston, 1921), p. 125: "the answer must come from . . . an appeal to the unsophisticated facts of the market. Things quoted under the same name and identically priced may be taken as identical."

Anticipations of the more modern point of view, which classifies commodities, not on general grounds, of universal applicability, but merely according to the particular purpose in view, may be found occasionally, as, *e.g.*, in these passages of Marshall's *Principles of Economics:* "The question where the lines of division between different commodities should be drawn must be settled by convenience of the particular discussion. For some purposes it may be best to regard Chinese and Indian teas, or even Souchong and Pekoe teas, as different commodities; and to have a separate demand schedule for each of them. While for other purposes it may be best to group together commodities as distinct as beef and mutton, or even as tea and coffee, and to have a single list to represent the demand for the two combined. . . ." (p. 100, n. 1); cf. also p. 105, n. 1.

Much more important to a clear understanding of the logical structure of classical thought, is the part played by the industry in the description of the workings of the competitive mechanism. The firms grouped into one industry were treated as though they were all producing an identical commodity, valued alike by the buyers in the market. There would be no preference whatsoever for the product of one of the firms over the product of any of its competitors. No discrepancies could arise between the prices charged by the various firms, since the slightest price difference would be sufficient to eliminate from the market the competitors attempting to charge the higher price. Under such circumstances, no firm could pursue an independent price policy; all had to abide by the common market price. Thus, from its definition of the industry, economic theory could derive, through sheer logic, a number of important assertions as to how the competitors would, in fact, behave.

Finally, the industry provided a convenient approach to the problem of profits. The identity of the products to be turned out by any firms entering a given industry suggested that the level of profit realized by the firms already in business was a good indication of the profits to be expected by the newcomers. They would sell at the same price, and face the same costs (these being determined by broad elements, equally binding for all the firms: the known technology of production, the market prices of the factors). The doctrine of free entry concluded that the level of profits would be determined by the competitive mechanism, ·through the entry and exodus of firms to and from the industry, under the incentive of business profits and losses.

Thus, the part ascribed to the concept of industry far outgrows its initial, hazy, definition. Indeed, if we want to save the logical consistency of the classical theory of pure competition, we must redefine the industry in such a way as to make it a suitable foundation to carry the heavy burden laid upon it. All the firms in the group must be assumed to turn out an economically homogeneous commodity, *i.e.*, the market elasticity

of substitution between the products of any two competitors
must be infinite. And, secondly, the free entry theory of profit
presupposes that newcomers would always be able to enter any
industry in which profits are high and to produce, at the same
cost, the same commodity as the firms already in business.[31]

B. UNDER MONOPOLISTIC COMPETITION

Both of these assumptions are challenged by monopolistic
competition theory. Over wide areas of business activity, the
typical form of competition is the rivalry of products which
are not completely identical with one another, but which, in
the buyers' minds, differ either in some of their physical char-
acteristics, or the location of the sellers, the incidental services
they provide, the goodwill they enjoy, etc. . . . Under such
circumstances, the profits of one firm become only a very distant
indication of what profits might be open to newcomers, whose
costs and products may not be identical to the costs and products
of the firms in business.

What, then, is the status of the traditional concept of in-
dustry, when taken over into monopolistic competition analysis?
Since monopolistic competition drops the strict criterion of
perfect homogeneity, and groups together products of various
degrees of heterogeneity, our definition cannot be based on any
identity between the products of the rival sellers. Indeed, such
a procedure would merely lead to this conclusion: where the
cruder analysis of the classicists saw only one commodity and
consequently one industry, a more modern approach discloses
a number of recognizable commodities, and "industries," gen-
erally one for each seller.

Such an approach, however, would have been disastrous
to any particular equilibrium analysis of value theory. Since
forces acting outside the "industry" were ignored, the whole
discussion would have shrunk down to a mere analysis of the
equilibrium of the firm, *i.e.*, to the old Marshallian analysis

[31] For a full discussion, cf. below, pp. 173–177. As there explained, this free
entry theory was somewhat relaxed under the assumption of increasing costs to
the industry. Cf. *e.g.*, J. Viner, "Cost Curves and Supply Curves," *Zeitschrift
für Nationalökonomie*, III (1931), 23–46.

of monopoly.[22] The dish would have been meager to be christened a "general theory of value." As, on the other hand, the Anglo-Saxon tradition shied away from the complexities of general equilibrium, both Mrs. Robinson and Professor Chamberlin took an easy, but somewhat contradictory, way out: instead of substituting the analysis of the firm for the analysis of the industry, they merely added the first, without foregoing the second. In the same breath with which they were denouncing the heterogeneity of the commodity, they still resorted to some grouping of the firms. Unable to base their grouping upon the old notion of product identity, they tried in various ways, to find a substitute for the old definition, and thus preserve a device without which particular equilibrium methodology could not survive.

(1) Mrs. Robinson keeps close to tradition. She recognizes at the outset the logical dilemma of paying attention either to the uniqueness of each firm's product, or to the universal substitutability of all economic goods, in their competition for the consumer's dollar.[23]

After that, however, she soon shrinks from the idea of being "reduced to regarding the output of each producer as a separate commodity" and prefers to a "logical definition" a "rough-and-ready definition . . . which is congenial to common sense and causes no trouble."[24]

Her explicit definition of a commodity is "a consumable good, arbitrarily demarcated from other kinds of goods, but which may be regarded for practical purposes as *homogeneous* within itself."[25]

Since the bulk of the Robinsonian analysis has to do with what is, in fact, the *heterogeneity* of that so-called *homogeneous* commodity, this wording seems, to say the least, unfortunate. Concretely, all economic products are viewed as forming a chain of substitutes the continuity of which is frequently broken by the existence of a sort of gap between one product and the

[22] Cf. below, Chapter III, 5, pp. 130–131.
[23] Robinson, pp. 4–5.
[24] Robinson, p. 5.   [25] Robinson, p. 17 (italics mine).

next one along the chain. Products isolated by such gaps from their substitutes on each side, can be classified together as forming one commodity, despite minor differences within the group.[36]

Mrs. Robinson, however, is very modest as to the usefulness of her own definition, for she confesses: "the correspondence of such an industry to the industries of the real world is not perhaps very close. But in some cases, where a commodity in the real world is bounded on all sides by a marked gap between itself and its closest substitutes, the real-world firms producing this real-world commodity will conform to the definition of an industry sufficiently closely to make the discussion of industries in this technical sense of some interest." [37]

(2) Mr. Kaldor is more sceptical: Mrs. Robinson's concept of industry "implies the assumption that the products of different firms consist of a 'chain of substitutes' surrounded on each side by a 'marked gap' within which the demand for each firm's product is *similarly sensitive* with respect to the price of *any* of the others. The 'boundary' is thus defined as the limit beyond which this sensitiveness ceases or at any rate becomes a different order of magnitude. No doubt for each *particular* producer there exists such a 'boundary.' But there is no reason to assume (except in some very special cases, involving a peculiar grouping of consumers) that this boundary is the *same* for any group of producers; or that the sensitiveness of demand for the products of any particular producer is of the same order of magnitude with respect to the prices of *any* group of his rivals.[38] Some producers will be 'nearer' to him, others 'farther off.' If the demand for cigarettes in a particular village shop is more affected by the price of beer in the opposite public-house than by the price of cigarettes in the shop at the nearest town, which of the two would Mrs. Robinson lump

[36] Robinson, p. 5.
[37] Robinson, p. 17.
[38] We shall consider here only the first part of Mr. Kaldor's criticism, *i.e.*, his denial of the existence of a common boundary for a group of producers. The second part of his attack must be related to the problem traditionally called the *oligopoly* or *small group* problem and will better be treated in the next chapter.

together into 'one industry': the seller of cigarettes plus the seller of beer in the village, or the seller of cigarettes in the village plus the seller of cigarettes in the town?" [39]

Mr. Kaldor's own conception is put forth in the following form: "Each 'product' can be conceived as occupying a certain position on a 'scale'; the scale being so constructed that those products are neighbouring each other between which the consumers' elasticity of substitution is the greatest (a 'product' itself can be defined as a collection of objects between which the elasticity of substitution of all relevant consumers is infinite). Each producer then is faced on each side with his nearest rivals; the demand for his own product will be most sensitive with respect to the prices of these; less and less sensitive as one moves further away from him. . . ." [40]

(3) It is clear from Professor Chamberlin's analysis of subgroups and chain relationships [41] that he is quite aware of the existence and importance of the situations described by Mr. Kaldor. For him both the Robinson and the Kaldor systems of relationships are met with in the real world, and the choice between the two must be decided in each individual case according to the facts.

The Chamberlinian "group" veers definitely away from the old Marshallian concept. It is no longer a definite economic entity, the existence of which has merely to be recognized by the investigator; it is an analytical tool which may and should be used with all degrees of inclusiveness. "Almost any general class of product divides itself into subclasses. . . . Evidently, a group may be large or small, depending upon the degree of generality given to the classification" and "even if it is large, if subgroups exist, this fact cannot be disregarded." [42]

The group, moreover, need not necessarily be defined on

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[39] N. Kaldor, "Mrs. Robinson's 'Economics of Imperfect Competition,'" *Economica*, I (1934), 339–340.

[40] N. Kaldor, "Market Imperfection and Excess Capacity," *Economica*, II (1935), 38–39.

[41] Chamberlin, pp. 102–104.

[42] Chamberlin, pp. 102–103; cf. also pp. 65, 151–154 and "Monopolistic or Imperfect Competition?" *Quarterly Journal of Economics*, LI (1937), 574.

the basis of the substitutability between the products. "[Industry] classifications based upon technological criteria" rather than upon "the possibility of market substitution" are also proposed.[43] Thus (as recently pointed out by Professor Chamberlin, in private discussions), there might be some tendency towards uniformity of profit expectations in the grocery trade the country over (largely for "technological" reasons of similar management problems, etc.) and for this reason it might be warranted for certain purposes to consider all grocers in the United States as a "group," although "substitutability" between their products would, beyond fairly narrow geographical limits, be nil.

C. UNDER GENERAL EQUILIBRIUM METHODOLOGY

This attempt at a more critical definition of commodities and groups has brought to light two alternative possibilities: the criterion of substitutability, found in both Mrs. Robinson and Professor Chamberlin, and the latter's suggestion of technological similarity. It remains to be seen whether either of them can serve the three purposes assigned by classical theory to its concept of industries.

(1) Both may be appropriate, and even reinforce one another, in achieving the first purpose: that of delineating practical boundaries for any given inquiry, in order to narrow down to essentials the empirical points to be investigated. Despite their undenied competition for the consumer's dollar, the problems of a haberdashery in Harvard Square will be discussed without bringing in the automobile industry in Detroit, nor even the Harvard Motor Company in Cambridge.

(2) In tackling the price relationship of various producers, the substitutability criterion appears the only relevant one. Although the technological criterion may give some presumption as to the comparative costs of the firms, it has only a very indirect and distant bearing on the comparison of their demand curves and of the possible discrepancies between the prices they charge.

[43] *Ibid.*, p. 568, n. 7.

On the other hand, the grouping together of the firms producing commodities which are close, but still imperfect, substitutes for one another involves, of necessity, a large degree of arbitrariness. Only the perfect substitutability of pure competition provides a clear, unambiguous demarcation. Even "natural gaps," where they exist, can only be defined in a vague, flexible manner: How much inelasticity of substitution shall be required before we call it a gap?

More important still is the fact that the slightest departure from perfect substitutability breaks the dikes which canalize competitive behavior into one, well defined, course. As soon as substitutability becomes imperfect, each competitor may choose to charge either a higher or a lower price than any of his rivals. Although the range of this freedom may be more or less narrow, this is only a matter of degree. Monopolistic competition throws us into the stream of general competitiveness between non-homogeneous products. In kind, the theoretical problems to be dealt with will be the same, no matter the degree of that heterogeneity, no matter whether the firms would be classified as belonging to the same or to different industries. Particular equilibrium methodology is no longer of any help. We may just as well face immediately the problem of general economic interdependence, as presented by Walrasian theory, rather than sacrifice generality without being rewarded by any gain either in simplicity or in definiteness.

(3) Both concepts (substitutability and technological similarity) may be integrated in the theory of entry. Here, as in section (1), we are dealing with approximations and presumptions, rather than with strict, logical theorizing. Two stages are to be distinguished: (a) What attracts new firms? (b) How does the entry of new firms eliminate excessive profits?

The answer to the first question is obvious. New firms are attracted if they perceive profit opportunities open to them. The profits realized by other firms are indicative in this respect only in so far as the circumstances explaining their success can be duplicated by the newcomers. Under pure competition, this may mean having identical products and identical costs.

Under monopolistic competition, this can only be approximated and guesses may be hazarded both on the basis of substitutability and of technological similarity. Substitutability is not an indispensable requirement since the market of the newcomer can be built up at the expense of firms other than the ones whose profits attracted him. A radio shop, for instance, may be opened in some community, because a similar one in a similar, but far distant, community has proven successful. And yet, there need be no significant competition between the two shops.

The second question cannot be answered in the same way. It is only through substitutability of the products that the entry of additional producers can affect the demand of any older firm and reduce its profits to the competitive level. The theory of entry cannot be built up on the basis of technological similarity alone. If only one criterion is retained, it should be the substitutability between the products of the firms in business on the one hand, and of the newcomers on the other.

Neither substitutability, however, nor technological similarity, can by themselves warrant the use of the group concept as a satisfactory solution for the problem of profit. As soon as the concept of perfectly free entry (identical product and identical costs) is abandoned, the door is opened for all kinds of possibilities. As Professor Chamberlin recognizes, "in the matter of entry, all that we need to say is that wherever there are profit possibilities they will be exploited so far as possible. The enjoyment of large profits by any particular firm is evidently an indication that others, by producing close substitutes, may be able to compete some of them away. The results may be very simply described without any concept of freedom or restriction of entry — without even the concept of an 'industry': some firms in the economic system earn no profits in excess of the minimum counted as a cost, others earn more than this, and in various degrees." [44]

In other words, the problem is not one of theoretical de-

[44] Chamberlin, "Monopolistic or Imperfect Competition?" *Quarterly Journal of Economics*, LI (1937), 567–568.

duction, but of empirical observation. And the infinite variety of all concrete cases cannot be reduced to one or two standard patterns, under the guise of a theory of industrial entry.

To summarize, it is now evident that monopolistic competition robs the old concept of industry (and also the Chamberlinian group) of any theoretical significance. As soon as the elasticity of substitution between two products is recognized as imperfect, their sellers can pursue independent price policies. In kind, the competition between two differentiated brands of cars is the same as the competition between cars and, for instance, tailoring. Indeed, the competition may be keener between Ford and Rogers Peet than between Ford and Rolls-Royce. The theoretical problem is the problem of general competitiveness between goods. Only in the case of pure competition does the grouping of firms into one industry, reduce to a more simple and more definite type the behavior and reactions of the sellers. Outside of that simple case, groupings of firms do not in the least reduce the complexity and variety of competitive patterns.

All that may be involved is a question of degree: every firm competes with all the other firms in the economy, but with different degrees of closeness. Is anything gained by limiting the investigation to a group of close competitors, which we would call a group or industry? In an empirical, statistical study, yes: we can, in this way, reduce to a manageable size the research work involved, without any serious loss in precision or exhaustiveness. In the general statement of value theory, no: when competition is discussed in general abstract terms, we may just as well make the group (or industry) co-extensive with the whole economic collectivity. The problems are the same, and the complexity is no greater.

In other words, the value of these groupings is only a concrete, empirical one: It is never useful to speak of "industries" or "groups" in a general, abstract way, but it may be very helpful to speak of the oil industry, the coal industry, the steel industry, etc. A careful inquiry, however, cannot blindly trust

traditional classifications and terminology as a safe method for building up these groupings. To revert to our previous example, an investigation of Ford's competitors will cover many non-car manufacturers before it bothers about the Rolls-Royce company.[45] Which firms shall be included in any one group will have to be decided, not on an *a priori* basis, but after an empirical survey of market realities.

Thus, in the restricted place where it is now confined, the concept of group, or industry, acquires a significance entirely foreign to the significance it had with the classicists. With them, it was the starting point of the analysis, an extra-economic datum from which the mechanism of market competition was deduced through sheer logic, a kind of formula which told us in advance how the competitors would behave. It is now seen to be merely the outcome of an empirical investigation, a summary of factual findings. It does not give us any additional knowledge. It opens no avenue to theoretical reasoning. All it does is to crystallize into convenient moulds the results of our market observations.

In the general pure theory of value, the group and the industry are useless concepts. The new wine of monopolistic competition should not be poured into the old goatskins of particular equilibrium methodology. When the study of competition is freed from the narrowing assumptions of pure competition, only two terms remain essential for the analysis: The individual firms, on the one hand; the whole collectivity of competitors on the other. It is out of these materials that a general theory of economic interdependence can be built most simply and conveniently. Before we come to that, however, we must face one difficulty: the traditional definition of a commodity was linked with the concept of an industry. What becomes of the former, now that we have rejected the latter?

[45] A grouping of the firms catering to one definite income group might be more significant than a grouping based on the hazard of a terminological identity between products as different from one another as a Ford and a Rolls-Royce. The channels of advertising, for instance, will be largely determined by the level of income of the prospective buyers.

4. The Recasting of our Basic Concepts

A. FROM A PHYSICAL TO AN ECONOMIC DEFINITION OF COMMODITIES

At first economic science built up its terminology and concepts from materials handed over to it by popular language and usage. The term "commodity" was one of those words which, for a long time, could be used without any question being raised as to its exact meaning. This absence of discussion points to a tacit acceptance of the popular definition, based mainly on physical description.

Under cover of this common sense notion, however, the progress of economic thought was slowly emphasizing more and more the importance of another element: the substitutability of the products on the buyers' market. Marshall, as I have already mentioned, is quite eclectic with respect to the classification of commodities and his utterances might be interpreted as foreshadowing the future importance accorded to substitutability as against physical characteristics.[46] Pareto treats as similar a material transformation of one commodity into another (*e.g.* wheat into bread) and a simple transfer over time (a loan), or over space (transportation).[47] In an article of Professor Hotelling,[48] the problem of product differentiation is investigated through a study of the locational form of such differences. More generally, the definition of production as a creation of form, space, time or possession utilities has long been a commonplace in economic texts.

Mr. Lerner is, to my knowledge, the first to have drawn the logical implications of this view: "If the same thing at a different place is not the same commodity it is only because the difference in its location prevents it from being substituted for, or used in the same way as, the same thing here." And so *"in calling the same thing at different places different commodities, we have rejected the criterion of physical similarity as a basis*

[46] Marshall, p. 100, n. 1.
[47] *Manuel,* pp. 175–176.
[48] "Stability in Competition," *Economic Journal,* xxxix (1929), 41.

for the recognition or classification of commodities and have
put in its place the principle of substitutability at the margin." [49]
Similar to differences in location are also differences, real or
imaginary, in type, brand, or quality and all the circumstances
giving rise to differentiation of the product. In the preceding
chapter we have noticed a similar view in Pareto, who regarded
as different commodities products physically identical but sold
under different credit conditions, different types of sales services,
etc. The degree of substitutability remains as the only criterion
that can be used either to distinguish or to classify together,
units of goods as identical or as different commodities.

The brilliant paradoxes which contribute so much to the
heterodox flavor of Mr. Lerner's article have rather to do with
the grouping together, because of perfect substitutability, of
articles which physically have nothing to do with one another.
At this point, we are more interested in the other side of the
picture, *i.e.,* the differentiation between commodities physically
similar.

It is this latter aspect that is stressed in an interesting article
by Jan Drewnowski.[50] The classification of commodities, once
it is deprived of its materialistic support, becomes, in gen-
eral, different for every individual. To speak of a market,
we must first make sure that a uniform definition of the com-
modity in question is accepted at least by one of the parties
entering upon the transaction, *i.e.,* by the buyers or by the
sellers. Such a market Drewnowski calls a *particular market*
(in opposition to the conventional *general market* for the com-
modity sold by the firms in the group or industry). He then
views the economic world as a system of particular markets,
"combined with a network of interdependability, *i.e.,* of com-
plementarity and competitiveness between the individual
commodities." [51] Most of these particular markets will be mo-
nopolistic (one seller), although they may also present the form

[49] A. P. Lerner, "The Concept of Monopoly and the Measurement of Monop-
oly Power," *Review of Economic Studies,* I (1934), 167.

[50] "The Classification of Commodities and the Problems of Competition and
Monopoly," *Studja Ekonomiczne,* Kraków, II (1935), 41–53.

[51] *Ibid.,* p. 51.

of duopoly, oligopoly or even perfect competition. This would be the case if various sellers (two, a few, or many) happen to offer commodities which, to the buyers are perfect substitutes; such an occurrence is more probable where the buyers are entrepreneurs, interested not in any particular relation between the commodity and their own individual wants, but merely in the expected profits the transaction will ultimately yield. "However, it is necessary to differentiate distinctly this widened form of particular markets, which are possible with our postulates, from the concept of the general market used by the traditional theory. For us the oligopoly or perfect competition are rather exceptional phenomena and always of only local importance." [52]

Drewnowski stresses the difference between his concepts and the theory of imperfect competition. In the text of his article, he seems to belittle the recognition given by monopolistic competition — under the name of product differentiation or market imperfection — to the existence of particular markets. "As for imperfect competition, in its generally accepted formulation, it is based on the concept of a general market just as perfect competition, and differs from the latter only in the smaller number of sellers [53] and as a result, in the imperfect elasticity of the demand curve for the commodity sold by them. The price of the commodity is accepted in equilibrium as an identical price for all sellers, just as in perfect competition. Imperfect competition understood in this way is inconsistent with the principle of non-uniform definitions for the same reasons as perfect competition. . . . If we accept the construction of particular markets we have monopolists everywhere where the traditional theory finds at most an imperfect competition." [54]

In a footnote, however, he takes account of the second aspect

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[52] *Ibid.*, p. 51.
[53] A similar identification of monopolistic competition with oligopoly seems to underlie in part the reasoning of N. Kaldor in the article, "Professor Chamberlin on Monopolistic and Imperfect Competition," *Quarterly Journal of Economics*, LII (1938), 513–529. Cf. below, pp. 153–155.
[54] Drewnowski, "The Classification of Commodities," etc., pp. 50–51.

of monopolistic competition doctrines (*i.e.*, the differentiation of the product) and concedes that "in connection with imperfect competition, there is indeed applied the conception of particular markets; usually it is not, however, exactly formulated and above all it does not exclude at all the existence of a general market, as the system of particular markets here introduced does." [55]

It will be clear to the reader that, once we have accepted the holocaust of the artificial group concept and restated the monopolistic competition case in terms of a general equilibrium theory of value, the resulting analysis is of much the same brand as Mr. Drewnowski's own construction. We are left facing a world of particular markets or of firms, cemented together by the pervasive influence of general economic interdependence.

In his *Marktform und Gleichgewicht*, H. von Stackelberg reveals a similar outlook: "We may conceive the supply side connection between monopsonists and the demand side connection between monopolists as the general form of market analysis. In the real world, a small number of goods only are completely standardized. Each seller, thus, finds himself in a position similar to a monopoly, but limited by the monopolies of related markets." [55]

Ricci's *polypol* [57] and Schneider's *universal monopoly* [58] depict a similar model.

B. OUR BASIC DEFINITIONS: FIRMS, COMMODITIES, FACTORS

With the disappearance of the old definitions of commodities and groups, it becomes all the more important to have a clear definition of our main economic unit: the firm. Fortunately, the problem can be settled easily. All our theory is built around the assumption that the firm (or the seller) maximizes its net

[55] *Ibid.*, p. 50, n. 1.
[56] H. von Stackelberg, *Marktform und Gleichgewicht* (Vienna and Berlin, 1934), p. 44 (translation mine).
[57] U. Ricci, *Dal Protezionismo al Sindacalismo* (Bari, 1926), pp. 131–165.
[58] E. Schneider, *Reine Theorie monopolistischer Wirtschaftsformen*, Beiträge zur ökonomischen Theorie (Tübingen, 1932), Chapter III, pp. 83–132.

revenue, calculated in monetary units. The firm must thus be defined in such a way as to fit this formulation.

Whether a financial concern which controls a number of plants, turning out widely different products, constitutes one or several firms, must be decided according to the facts of the concrete case at hand. If the policy of each plant is determined only after consideration of its repercussions on the total profit expectations of all the plants in the concern, the whole concern forms only one firm. If, on the contrary, the profits, and consequently the policies, of each plant are studied independently, it will be simpler to consider each plant as a separate firm. In brief, the frontier of the firm will be the frontier of the maximizing unit.[59]

The definition of commodities and factors [60] must be made with reference to these maximizing units. The first step is to forget the broad, traditional classification which, on purely physical criteria of similarity, jumbles into one commodity the products of several firms. If the firms, not the industries, are our economic units, we must adopt a corresponding starting point to define commodities. If the products of various firms are to be associated, it is at a later stage, and on economic, not physical, criteria. This grouping problem will come up in the next chapter.

The question is rather to detect whether the firm is itself narrow enough as a frame of reference for the definition of commodities and factors. Indeed, the same firm can, and usually does, produce a number of products extremely different both physically and in their appeal to the consumers.

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[59] The household would be similarly defined as the unit of maximization: what is maximized, however, is no longer monetary revenue, but ophelimity, or an ophelimity index. Modern discussions may make it necessary to adopt a more sophisticated terminology, but the underlying reality is unaffected thereby and the parallelism between the firm and the household remains valid, so far at least as the present problem is concerned. The parallel is even more striking if one remembers that maximization of monetary revenue is merely a simplified version of maximization of ophelimity. In his discussions of monopolistic equilibrium, Pareto always mentions both assumptions: cf. *Manuel*, pp. 594–595 and 615–616.

[60] The same good is termed a commodity or a factor depending on which point of view is adopted: the one of the seller or the one of the buyer.

Within the same firm, we shall consider as different commodities, or factors, units of goods between which the entrepreneur himself differentiates; we shall group together all units of goods which the producer considers as perfectly interchangeable. This attitude on the part of the producer will depend, so far as factors bought are considered, on the technical circumstances of their use; so far as goods to be sold are concerned, it will result from the absence of buyers' preferences.

Such a set of clear, unequivocal definitions is badly needed at the outset of our theory of value. Instead of the hazy notions of groups, industries, commodities and factors used so far, the analysis will be built up from clearly defined elementary units: (1) the *maximizing unit*: firm (enterprise, producer, seller, . . .) or household; (2) *commodities* and *factors*, as classified by the maximizing units concerned in the problem at hand.

As for the broader groupings implied in the traditional theories and definitions of monopoly, oligopoly, competition, etc. they should not be made an *a priori* element of economic analysis; they are rather the natural subject matter and the result of an economic theory of value. This new point of view will enable us to perceive the true contribution of monopolistic competition to economic science in general (in its continental, general equilibrium expression, as well as in its particular equilibrium forms), and to dissipate the obscurities and contradictions that presently face us at the beginning of our theory of value.

5. SUMMARY

We have, in this chapter, examined critically the general body of monopolistic competition doctrine, disentangled from the partly divergent statements confronted in Chapter I. Three main problems have been raised that had not been clearly perceived or solved in current expositions of monopolistic competition: the problem of the interdependence of the firms, the problem of the objective or subjective nature of the sales and cost curves, and, most important of all, the vital problem of

defining exactly the "elementary quanta" of our analysis: commodities and firms.

We are now ready to embark upon the second, more positive stage of our investigation: the construction of a more general value theory, integrating as one of its component parts an analysis of monopolistic competition purified of its present obscurities and contradictions.

CHAPTER III

THE THEORY OF EXTERNAL INTERDEPENDENCE

THE abandonment of the group concept has deprived us of
the keystone in the traditional classification of the interde-
pendence of firms into monopoly, duopoly and oligopoly, monop-
olistic and pure competition. This classification depends upon
the number of firms in the group on the one hand, and on
the other, upon the differentiation, or absence of differentiation,
between the products of these firms. Both criteria are in-
applicable when we dismiss the notion of a group, and attempt
to build our theory from the concrete firm upward, without
recourse to any intermediate grouping between the single firm
and the whole economic collectivity.

I shall, in the present chapter, suggest an alternative to the
discarded criteria and classification. I hope that the new ar-
rangement will be recognized to be based on more solid founda-
tions and, at the same time, to be also more complete and more
systematic than the former.

The problem of the interdependence of the firms is generally
discussed almost exclusively in terms of demand. The same
problem, however, is admitted to exist also on the cost side
of the firm's situation. I shall take up in succession both of
these aspects in the first two sections of this chapter. In the
third section, I shall examine briefly a third mode of inter-
dependence (reducible to the first two): the interdependence
of the firms as to entry.

When discussing the interdependence of sellers, it was neces-
sary to ignore momentarily all problems and complexities
which may arise on the buying side of the market; similarly,
the discussion of cost interdependence must be isolated from
the analysis of the position and behavior of the sellers of these
cost factors. It is thus necessary to bring together, for a final

synthesis, the two problems so far discussed in isolation: this, a generalization of the traditional bilateral monopoly case, will be taken up in section 4.

The way will then be clear for a more detailed investigation of the two extreme, limiting, cases of pure monopoly and pure competition. I hope to convince the reader that the exact significance of the cases traditionally discussed under these names has been generally misunderstood, owing to the logical laxity of the definitions used to characterize them. The core of the case of pure competition, in particular, will be seen to reside neither in the number of sellers, nor in the identity of prices, nor in the absence of profits, nor even in the slope of the sales curve.

1. INTERDEPENDENCE IN SELLING [1]

A. PROVISIONAL SIMPLIFICATIONS

The problems of monopoly and competition are traditionally viewed from one angle only: the rivalry of the firms in selling their products on the market. The interdependence of the firms as buyers of cost factors is generally ignored. The same point of view will be followed in this first section.

A second simplification will also be effected by assuming provisionally that the buyers consider prices as parameters, *i.e.*, imagine them to be unaffected by the volume of their purchases.

These two simplifications are needed to isolate the question

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[1] The whole treatment of interdependence will run in terms of price competition. It is realized, however, that the competition between the sellers can take place not only through the channel of prices, but also by means of advertising, changes in the quality of product, etc. . . . These market techniques are more supple than simple price variations, and they may possibly be directed at, and cut more deeply into, the market of a few of the competitors, rather than spread their effect over a larger number of rival firms. A price classification, as the one proposed in this study, is by no means exhaustive and, strictly speaking, it should be complemented by similar classifications based on other strategic factors in business competition. Formally, we might add to the criterion $\dfrac{p_j\,\delta R_i}{R_i\,\delta p_j}$ used below, other criteria of the type $\dfrac{x_j\,\delta R_i}{R_i\,\delta x_j}$, where x_j may be taken to represent successively all the various elements (other than price), such as advertising, etc. . . . through which j may affect his sales and the revenue of his competitors.

of the interdependence of the firms as to the demand for their products. They will be removed in the following sections of this chapter.

<div align="center">B. CLASSIFICATION OF CASES</div>

The first and, one should expect, the most obvious, characteristic to point out when discussing monopoly and competition is the relative content of these terms. Competition refers to a *relationship between sellers*, not to the position of one isolated firm; similarly, monopoly is defined by the absence of the type of relationship defined as competition.

This elementary, but essential, condition of the problem has largely been missed in theoretical discussions.

Historically, the first classification of firms' interdependence emerged from a fairly simple and straightforward criterion: the number of rival sellers. An industry comprising only one firm was a monopoly. The presence of two firms gave rise to duopoly; of a few, to oligopoly; [2] of many, to competition. The distinction between a few and many, and consequently the transition from oligopoly to pure competition, was not always scrutinized very thoroughly. Eminent theorists were satisfied that even duopoly would lead to the same result as pure competition.

Within one industry, the problem was thus viewed correctly as one of relationship between sellers. Such a simple criterion, however, also had its drawbacks. First of all, no attention was paid to the relationships between firms belonging to different industries. And secondly, the whole picture was needlessly distorted by assuming that, within one industry, the relationship between all the firms was always symmetrical. If, for instance, the industry was composed of many firms, each and every firm in it was deemed to be in pure competition with all the others.

Anyway, the whole classification was dependent upon the

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[2] Or, in Cournot's terminology, "limited competition." The oligopoly case is old in economic discussion, although the word itself has been coined only recently: cf. Chamberlin, p. 8, n. 2.

concept of group or industry. When this concept is abandoned, the criterion of numbers is left in mid-air.

A second type of criterion was proposed by Pareto and still plays an important role in most expositions of monopolistic competition theories. It is the distinction between type I and type II behavior, or, in more modern terminology, the perfect or less than perfect elasticity of the sales curve. I shall reserve for a later section a detailed criticism of this viewpoint. Let us merely insist for the moment that the elasticity of *one* firm's sales curve cannot be taken as the essential element in the definition of competition, which refers to a *relationship* between several firms. What is true is that this elasticity depends, *inter alia*, upon the degree of competition between the firm and its rivals, and that pure competition always results in a perfectly elastic demand curve.

When the problem is viewed as a problem in the interrelationship of firms, neither of the previous solutions appears adequate. A new attempt will now be made in a very different direction.

The seed of a correct solution can be found, I think, in the criterion used by Professor Chamberlin to distinguish between the large group and the small group. Let us recall it briefly, and consider anew the symbolic expression presented for it·in Chapter I.[3] The group is large if "any adjustment of price. . . . by a·single producer spreads its influence over so many . . . competitors that the impact felt by any one is negligible and does not lead him to any readjustment of his own situation."[4] In symbolic terms, $\frac{\delta R_i}{\delta p_j}$ is of insignificant size, with respect to the other elements of the profit-maximizing calculations of the seller.[5] Failing this, the group (no matter how numerous the firms it includes)[6] is treated as being small.

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[3] Chapter I, pp. 27–28.   [4] Chamberlin, p. 83; cf. also pp. 103 and 104.

[5] Let us recall that R stands for total revenue, p for price, the subscripts i and j for any two different firms.

[6] Chamberlin, pp. 103–104. In Professor Chamberlin's terminology, however, if numbers are large the group is said to be large but the "considerations

Professor Chamberlin's criterion, however, serves him merely to distinguish between the large and the small groups. It is used to characterize neither monopoly, nor pure, nor monopolistic competition. Besides, the criterion, as formulated, is intimately connected with the group concept and with the symmetry assumptions of Professor Chamberlin's exposition. Our task will thus be double: we shall first broaden the formulation of the criterion so as to make it independent of the special assumptions with which it is linked; and secondly, we shall broaden its use so as to cover, not only the Chamberlinian distinction between large and small groups within the general category of monopolistic competition, but also the classification of all the cases of firms' interdependence, from pure monopoly to pure competition.

The special assumption of a group composed of firms, all perfectly symmetrical with one another, has a triple bearing upon the form of the criterion.

First of all, the relative importance of the impact felt by various firms $2, 3, 4, \ldots$ when firm 1 changes its price can be expressed by the coefficients $\dfrac{\delta R_2}{\delta p_1}, \dfrac{\delta R_3}{\delta p_1}, \dfrac{\delta R_4}{\delta p_1},$ etc. only so long as all the firms have the same volume of business, expressed in monetary units. When the symmetry assumption is dropped, a more sophisticated expression should be chosen, which takes into account the *relative* importance of the changes. This will be a formula of the elasticity type: $\dfrac{p_j \, \delta R_i}{R_i \, \delta p_j}.$

Secondly, Professor Chamberlin's use of the criterion to isolate the cases where oligopolistic difficulties are absent also depends upon the symmetry assumptions, or, more specifically, upon the assumption that the coefficient $\dfrac{\delta R_i}{\delta p_j}$ (or, in the elasticity

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relevant to competition between small numbers" will be the ones to apply. Such a vocabulary, by paying lip service to the outworn criterion of numbers, confuses needlessly the real issue. Numbers are only indirectly relevant in making it more or less likely that $\dfrac{\delta R_i}{\delta p_j}$ be of insignificant size.

form $\frac{p_j\,\delta R_i}{R_i\,\delta p_j}$) is of identical value for all the firms in the group. For, what is important with respect to oligopolistic influences, is not the influence of the firm under consideration upon the other firms, but the more complex question of this influence coupled with the sensitiveness of the firm to the reactions of these other firms. In other words, oligopolistic indeterminacy arises not from the influence of the firm i upon other firms j, but from the fact that this influence induces reactions that will, in their turn, affect i's revenue. It is only this mutual interaction that offers some leeway for the poker game element which characterizes the oligopolistic problem. Consequently, the coefficient $\frac{p_j\,\delta R_i}{R_i\,\delta p_j}$ which expresses the influence of j upon i must be supplemented by a second coefficient expressing the influence of i upon j. The first coefficient suffices Professor Chamberlin because, owing to his symmetry assumption, the influence of i upon j is the same as the influence of j upon i.

Thirdly, the abandonment of the group concept and of the symmetry assumptions compels us to give consideration to the relative character of the classification. Firm 1 may be at the same time in close competition with firms 2, 3, in very indirect competition with firms 4, 5, and in practically no competition at all with firms 6, 7, etc.[7]

Having made these preliminary remarks, we might now proceed directly to our goal and base on the coefficient $\frac{p_j\,\delta R_i}{R_i\,\delta p_j}$ a clear-cut classification of the various types of competition between sellers. In order, however, to make the analysis of competition in selling perfectly symmetrical with the forthcoming analysis of competition in buying, it will be better to consider, instead of revenue (R), quantities of sales (q). The

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[7] Cp. Chamberlin, pp. 103–104. Particular equilibrium methodology seems to have prevented Professor Chamberlin from recognizing the full bearing of this phenomenon upon the meaning of the various concepts of competition and monopoly.

coefficient thus becomes $\dfrac{p_j \,\delta q_i}{q_i \,\delta p_j}$, expressing the influence of a change in j's price upon i's sales.

First of all, let us take the case where the slightest cut in p_j, p_i remaining unchanged, or the slightest rise in p_i, p_j remaining unchanged, reduces to zero the sales (and revenue) of i, driving all its customers toward firm j. The value ∞ then reached by the coefficient gives us an *economic* indication of the homogeneity of the goods sold by the two firms. In the traditional terminology, the two firms would be said to be selling the *same* commodity. Depending on the number of firms between which such a relation exists, the case would be classified as duopoly, oligopoly, pure competition. Let us call the general category *homogeneous competition.*

The extreme opposite would be the case where the sales of i would be entirely unaffected by any change in the price charged by firm j. The value of the coefficient $\dfrac{p_j \,\delta q_i}{q_i \,\delta p_j}$ would be o, and no competition at all would be present between i and j. If this independence of the firm i from price changes in the product of another firm j persisted with respect to each and every other firm, the firm i would escape completely the pressure of competition, and its situation might be recognized as a case of *pure monopoly*, in the most radical sense of the term.[8]

Finally, there remain the intermediate cases where a cut in p_j, p_i remaining unchanged, or a raise in p_i, p_j remaining unchanged, affects the volume of i's sales without reducing it to zero. The coefficient then takes a finite value. The two firms i and j are in competition with one another, but the link between them is far less rigid than in the case of homogeneous competition. The products of the two firms are economically heterogeneous and the competition may be termed *heterogeneous competition.* The category corresponds to Mrs. Robinson's imperfect competition and to Professor Chamberlin's monopolistic competition, *stricto sensu.*

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[8] Cf. below, 5, pp. 125–133.

We thus have the three general categories of:

(1) *isolated selling* (culminating in *pure monopoly*) when the coefficient $\dfrac{p_j\,\delta q_i}{q_i\,\delta p_j} = 0$;

(2) *heterogeneous competition* between firms for which the coefficient $\dfrac{p_j\,\delta q_i}{q_i\,\delta p_j}$ takes a finite value;

(3) *homogeneous competition* between firms for which the coefficient $\dfrac{p_j\,\delta q_i}{q_i\,\delta p_j} = \infty$.[9]

In the last two categories, a subclassification may be introduced. Where the firms are in competition (as against the case of isolated selling) their interrelationship may, or may not, involve oligopolistic elements of indeterminacy. The distinction cannot be drawn in an exact and complete form without involving the cost aspect of the situation. We may, however, accept provisionally an approximate solution, based on the revenue or demand side alone. Oligopolistic difficulties will arise if both of the following conditions are realized:

(1) the firm i is submitted to the competition of other firms j; in other words, $\dfrac{p_j\,\delta q_i}{q_i\,\delta p_j}$ is significantly different from zero;

(2) some of these firms j that influence i are themselves affected by the changes in the price-output policy of firm i; this may be expressed in the condition that $\dfrac{q_i\,\delta p_j}{p_j\,\delta q_i}$ be also significantly different from zero.

The first condition being already included in the definition of heterogeneous and of homogeneous competition, the sub-

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[9] Strictly speaking, the partial derivatives do not exist for discontinuous changes, so that the values ∞ and o are impossible of realization. The objection is just as valid against the traditional characterization of pure competition by the infinite elasticity of demand. Homogeneous competition and pure monopoly should be conceived of as *limiting cases*: we might rephrase our definitions and say that as our coefficient *approaches* the values o or ∞, we *approach* the cases of pure monopoly or of homogeneous competition.

division can be made on the basis of the second coefficient alone. We thus have the following classification:

(1) *isolated selling*: no oligopolistic element being involved; (2) *heterogeneous competition: a.* oligopolistic, or circular; *b.* non-oligopolistic, or atomistic; (3) *homogeneous competition*: *a.* oligopolistic: this being the traditional case of pure oligopoly; *b.* non-oligopolistic: this being the traditional case of pure competition.

The three main categories of isolated selling, heterogeneous and homogeneous competition can be represented graphically in the following way (cf. Figures II and III). Let us put the values of p_j in abscissae, of q_i (or R_i) in ordinates.
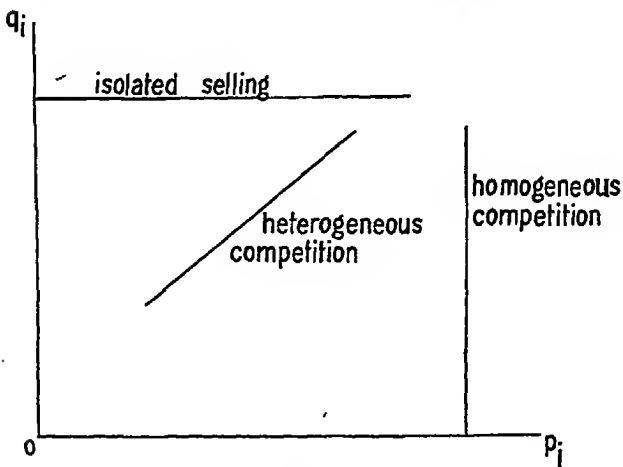
FIGURE II

The case of isolated selling (q_i independent of variations in p_j) will be represented by a horizontal curve; the opposite case of homogeneous competition (q_i falling to o for any cut in p_j) by a vertical curve; heterogeneous competition (q_i varying con-

tinuously in the same direction as p_j,) [10] by a positively sloping curve.

The competition between two firms, however, need not be of the same type for every level of prices. Indeed, a theoretical case might be constructed where the curve of heterogeneous competition would exhibit a slope varying with the level of prices, between the two limiting cases where one or the other of the two firms would be excluded from the market. The situation of firm i throughout this process is pictured on Figure III.
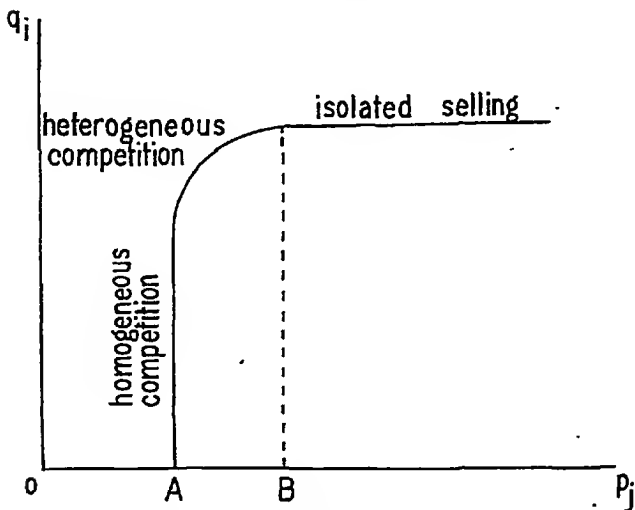
FIGURE III

Both on Figures II and III, p_i is supposed to remain invariant, so that the modes of competition are characterized with relation to some levels of both p_i and p_j. There are two critical points A and B in the relationship between the two prices. Between the limits set by these two points, heterogeneous com-

[10] We ignore the case of *heterogeneous complementarity*, where q_i would vary inversely to p_j.

petition prevails between the two sellers i and j. When p_j is raised beyond B, i becomes an isolated seller with relation to j; when it is cut below A, j becomes an isolated seller with relation to i, who, in fact, would have ceased to sell at all. Another diagram might be drawn, showing similarly what happens to j's sales, at different levels of i's price.

The traditional theory of value visualizes the modes of interdependence between the firms as more stable relationships, depending on the physical characteristics of the goods, and defined without any reference to the level of their prices. These price relationships, however, are implied in the analysis and appear in the open when we investigate the fate of individual competitors. Under duopoly, for instance, p_i and p_j are assumed to be identical; when p_i falls under p_j, j ceases to sell and i remains the only seller; when p_j falls under p_i, it is i who loses his market to j. Whether there will be two sellers or only one thus depends on the price decisions of i and j, and these may be affected by cost as well as by demand conditions. Similarly, under pure competition, the firms which try to charge a higher price than their competitors exclude themselves from the market. Whether they will prefer this economic death to the acceptance of a lower price cannot be foretold from an analysis of demand conditions alone.

Their decision, of course, will be made, not in terms of the infinitesimal price differences considered so far, but with reference to finite movements. There is for each seller a definite price (the level of which depends on his cost conditions) below which he will refuse to go: he will drop from the market when price falls under that limit, he will be in the market when the price is higher.[11] Thus, the number of competitors will depend on the level of price (and ultimately, on the cost conditions) of the various firms. The single seller may be in a monopolistic position until a certain price is reached, but may be sure to

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[11] Owing to costs of transfer, there will be a difference between the level at which a firm enters the market and the level at which it withdraws from it. Cf. G. F. Shove, "The Imperfection of the Market: a Further Note," *Economic Journal*, XLIII (1933), 119-121; and J. Robinson, "What is Perfect Competition?" *Quarterly Journal of Economics*, XLIX (1934), 108-111.

arouse one or more competitors if he ventures beyond certain limits. The definition of the case as monopolistic must be qualified accordingly. All this, however, brings in the problem of entry to which a special section will be devoted later on.[12]

In section 6, I shall also deal in more detail with the differences in viewpoint between the proposed and the traditional concepts of pure competition.

2. INTERDEPENDENCE IN BUYING

The firms are not only interdependent with respect to their sales curves; they are similarly interconnected through the mutual influences they may have on each other's costs. This second form of interdependence can be discussed with the help of a coefficient paralleling closely the one employed for the demand side.

But, before we can come to that, we must dispose of an initial difficulty. If we neglect the case of joint production (which presents no special difficulty, but would complicate needlessly the exposition), the sales of the firm are expressed through a single variable: the quantity q of the marketed product; on the cost side, however, the "quantity" to be taken into account refers to no single variable, but to a conglomeration of commodities and services, *i.e.*, the various factors used in the production of the commodity sold by the firm. The first task confronting us will be the analysis of the cost curve into these elementary components: the quantities of the various factors used by the firm and their respective unit prices.

A. THE ANALYSIS OF THE COST CURVE

If an unvarying combination of the different cost factors were used throughout by the firm, no matter what their prices or their level of output, these cost factors might, for all economic purposes, be grouped together into a single, composite factor. It would then be perfectly proper to analyze total costs into the unit price and the amount used of that one compound; and the problem we are about to investigate would not arise.

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[12] Cf. below, 3, pp. 117-123.

Under the name of fixed coefficients of production ("coefficients de fabrication déterminés *a priori*"), this assumption explicitly supports the Walrasian system of equations,[13] and is not dropped until we come to the "Leçon 36me" in the section devoted to the prerequisites for, and consequences of, economic progress.[14] Similarly, Pareto first solves the problem of general equilibrium under the assumption that the coefficients of production are given, at least for any given amount of output.[15]

When the assumption is withdrawn, and substitutability between the factors of production is considered, the optimal combination of factors is determined, for each amount to be produced, by the condition that total cost be minimized. Walras's and Pareto's expositions, however, are made needlessly cumbersome by their use of the ill-fated "coefficients de fabrication." These are first defined as expressing the amounts of services needed to obtain one unit of the product,[16] but this definition becomes a burden on the analysis when variability of the coefficients is taken into account. In the *Manuel*, Pareto resorts to a new definition of the coefficients as partial derivatives, indicating the change in the amount of services corresponding to infinitesimal changes in the quantity produced of the various commodities.[17] By dropping the use of production coefficients, more modern statements of the theory of production have attained a high degree of elegance and clarity.[18]

The theory of production is generally understood to include three different problems:

[13] Walras, pp. 211–213.   [14] Walras, pp. 371–384.

[15] *Manuel*, pp. 607–608.

[16] Walras, pp. 211–212; Pareto, *Cours d'Economie Politique* (Lausanne, 1896), vol. I, pp. 48–49.

[17] *Manuel*, pp. 607–608. On the Walrasian and Paretian theories of the production coefficients, cf. Henry Schultz, "Marginal Productivity and the General Pricing Process," *Journal of Political Economy*, XXXVII (1929), 505–551; J. R. Hicks, "Marginal Productivity and the Principle of Variation," and H. Schultz, "Marginal Productivity and the Lausanne School," *Economica*, XII (1932), 79–88, and 285–300.

[18] H. von Stackelberg, *Grundlagen einer reiner Kostentheorie* (Vienna, 1932); E. Schneider, *Theorie der Produktion* (Vienna, 1934); N. Georgescu-Roegen, "Fixed Coefficients of Production and the Marginal Productivity Theory," *Review of Economic Studies*, III (1935), 40–49; P. A. Samuelson, "A Comprehensive Restatement of the Theory of Cost and Production," (*unpublished*).

(1) A technological problem: what is the maximum output which can be derived from any given input of factors? This is no economic problem, but rather a datum for the economist.

(2) A problem in combining factors: given the technological datum expressed in (1) plus the relative costs of the factors, in what proportions should the factors be combined in order to minimize total cost for any output wanted? When this second problem has been solved, we know the cost of production of every possible output: this is the information traditionally embodied in the cost curve.

(3) A problem in determining the level of output: given the cost curve derived in (2), and given the sales curve of the firm, how will the entrepreneur determine the amount to be produced so as to maximize profit?

The latter problem is familiar to Anglo-American readers as the problem of the *equilibrium of the firm*, derived on the basis of a preliminary knowledge of the cost and sales curves of the firm. This has been analyzed above (pp. 20–21) and our only concern here will be with the derivation of the cost curve, *i.e.*, with the minimization of total cost for given amounts of output. As was indicated above, we shall proceed in two steps: we shall tackle first the technological problem, and secondly the economic problem of production.

1. *The Technological Problem*

Technological knowledge determines for each individual firm the maximum amount of output obtainable from any given set of factors' inputs.[19]

This we may write

$$\overline{q} = f(v_1, v_2, \ldots v_n).$$

Now if the maximum quantity $\overline{q}$ can be obtained only from a unique combination of factors, the economic problem of choosing the minimum cost combination is readily solved by using all

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[19] The first statistical investigations in this field have been made by agricultural economists: cf. H. R. Tolley, J. D. Black and M. B. J. Ezekiel, *Input as Related to Output in Farm Organization and Cost-of-Production Studies*, (United States Department of Agriculture Bulletin No. 1277, Sept. 1924).

cost factors in these proportions technically indicated as maximizing output; technical waste, however, will be economically indifferent, or even desirable, with respect to costless factors and to factors the price of which would be negative.

The economic problem becomes more complex when the same quantity $\overline{q}$ can be obtained from various combinations of substitutable inputs $v_1, v_2, \ldots v_n$. In this case, economic considerations alone can determine, in combination with technical knowledge as expressed in the production function, the manner and degree in which advantage will be taken of this substitutability so as to minimize cost relative to output.

2. *The Economic Problem*

The entrepreneur is bent on obtaining any output he decides upon, at a minimum total cost. In this endeavor, he is limited by the technological possibilities expressed in the production function. That is to say, the entrepreneur minimizes

$$C = \Sigma w_i \, v_i \qquad\qquad (i = 1, 2, \ldots n)$$

subject to

$$f(v_1, v_2, \ldots v_n) = \overline{q}$$

(where C stands for total cost, and $w_1, w_2, \ldots w_n$, represented by w_i, for the unit prices of factors $v_1, v_2, \ldots v_n$, represented by v_i.

By using Lagrange's method, we define

$$G = \Sigma w_i \, v_i - \lambda \left[f(v_1, v_2, \ldots v_n) - \overline{q} \right]$$

and write the necessary minimum conditions

$$\frac{dG}{dv_i} = \frac{\delta}{\delta v_i}(w_i \, v_i) - \lambda \frac{\delta q}{\delta v_i} = \frac{\delta w_i}{\delta v_i} v_i + w_i - \lambda \frac{\delta q}{\delta v_i} = 0$$

This may be rewritten

$$\frac{1}{\lambda} = \frac{\dfrac{\delta q}{\delta v_i}}{\dfrac{\delta w_i}{\delta v_i} v_i + w_i} \text{ or, } \frac{1}{\lambda} = \frac{\dfrac{\delta q}{\delta v_1}}{\dfrac{\delta w_1}{\delta v_1} v_1 + w_1} = \frac{\dfrac{\delta q}{\delta v_2}}{\dfrac{\delta w_2}{\delta v_2} v_2 + w_2} = \cdots$$

i.e., the marginal physical productivity $\left(\frac{\delta q}{\delta v_i}\right)$ of every factor used must be brought to proportionality with its marginal cost $\left(\frac{\delta w_i}{\delta v_i} v_i + w_i\right)$ to the firm.[20]

Among the various elements in this formula, v_i and w_i are perfectly determinate, easily ascertainable quantities; $\frac{\delta q}{\delta v_i}$ is a technical datum;[21] only $\frac{\delta w_i}{\delta v_i}$, embodying the influence of the firm on the cost of the factors it buys, involves the question of interdependence between the buying firms.

B. COST INTERDEPENDENCE

The interdependence of the firms as buyers of factors enters in traditional economic theory only through a back door, in the chapter on external economies and diseconomies. There has been nothing to correspond on the buying side of the firm's activity, to the phenomena of monopoly, duopoly, etc. Mrs. Robinson first presented, in her *Economics of Imperfect Competition*, the case of monopsony.[22]

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[20] When, as is usually done, the firm is assumed from the start to have no influence whatever on the price of the factors it buys, this reduces to

$$\frac{1}{\lambda} = \frac{\frac{\delta q}{\delta v_i}}{w_i}$$

i.e., the marginal productivity of every factor used must be proportional to its price.

In the general case, as well as in this special one, λ may be shown to correspond to the marginal cost of production, equal at the equilibrium point to marginal revenue and, when the product is sold in a purely competitive market, to price.

From the formulas above, it is easy to derive the general equilibrium condition that the marginal cost of a factor to the firm (and, under purely competitive conditions on the factor's market, its price) is equal to its marginal *value* productivity to the firm (*i.e.*, marginal physical productivity multiplied by marginal revenue; or, under purely competitive conditions on the market for the firm's product, marginal physical productivity multiplied by the price of the product).

[21] Cf., however, below, pp. 169–171.

[22] Robinson, pp. 211–231.

The problem, however, must be considered in a more general way: other types of interrelationships, intermediate between monopsony and pure competition, can be distinguished paralleling the classification of interdependence of the firms as sellers.

The problem is usually shelved by assuming that each factor used by the firm is bought on a "perfect market," in competition with a large number of other firms buying exactly the "same" factor. Hence the assumption of a perfectly elastic supply of each factor to the firm, and the substitution of market price for the marginal cost of a factor to the firm.

Factors, as well as commodities, have, in Chapter II, been defined with reference to a single firm. Thus, we do not assume, *a priori*, any price identity or physical interchangeability between a factor i and any factor bought by any other firm. The price of i, however, may be influenced by the purchasing and selling of factors and products [23] by other firms. In addition, the price paid by the firm for one of its factors may also depend on the amount of other factors bought by the same firm. This second type of interdependence, however (just as the interdependence between the prices of various products sold by the same firm) does not involve any possible indeterminacy in the decisions of the firm; it merely makes more complex the calculations implied in the search for maximum profit.

Let us define a coefficient of interdependence $\dfrac{w_j\,\delta v_i}{v_i\,\delta w_j}$, reminiscent of our former coefficient $\dfrac{p_j\,\delta q_i}{q_i\,\delta p_j}$, and expressing the relative change in the quantities v_i of factor i that the firm considered will be able to buy at an unchanged price w_i, when

[23] What the buyer calls a factor is a product to the seller. For the sake of briefness of expression, I shall, in what follows, speak only in terms of factors and prices of factors. When I speak of the price w_j of factor j bought by any firm F, it should not be forgotten that I designate at the same time the price p_j charged to firm F by the seller: the symbol w_j might thus be written p_j just as well.

there is a change in the price of w_j of factor j. As in the analysis of interdependence of demand, I assume perfect atomization on the other side of the market, *i.e.*, I assume that the sellers of each factor act competitively, considering price as a parameter. I shall come back later to the significance of this assumption; its removal will be seen to be in some cases innocuous, in other cases fatal, to the determinateness of equilibrium.

(1) $\dfrac{w_j \, \delta v_i}{v_i \, \delta w_j}$ may be equal to 0, expressing perfect independence

between the factors considered. The case may be labelled *isolated buying*. If the change in v_i remained nil, whatever changes took place (even cumulatively) in all other prices but w_i, the case might be called *pure monopsony*.

(2) The cases where $\dfrac{w_j \, \delta v_i}{v_i \, \delta w_j}$ takes a finite value may be grouped

under the general heading of *heterogeneous factors' competition* or, more concisely, *heteropsony*.

(3) Finally, $\dfrac{w_j \, \delta v_i}{v_i \, \delta w_j}$ may reach the value of $-\infty$: for any in-

crease in w_j, the firm is unable to get any amount of v_i at the price it used to pay before the change in w_j. This may be termed *homogeneous factors' competition*, or *homeopsony*.

The last two categories must again be subclassified according to whether or not the interdependence they indicate implies oligopolistic circularity. As formerly, we have to consider

whether these firms which, according to the coefficient $\dfrac{w_j \, \delta v_i}{v_i \, \delta w_j}$,

influence the firm under consideration, may at the same time be influenced by it.

If a change δv_i in the quantity of one of the factors i used by the firm (or in the amount of the product turned out) may so react on the prices w_j of various factors used by other firms that the readaptations of these firms, either in isolation or by cumulating their effects, can in their turn influence the first

firm, an oligopolistic situation will arise, preventing us from deriving a determinate solution through the methods of traditional equilibrium economics.

The oligopolistic difficulty will not arise, although the prices of some factors j, used by other firms, influence the first firm's market for one of its factors i (general case of homeopsony and heteropsony, as opposed to pure monopsony), if these prices are not themselves so significantly affected by the first firm's actions as to lead to circular interdependence.

It is now possible to give its precise meaning to the word "significant," and to define the oligopolistic problem in its generality, instead of defining it with reference either to demand alone or to cost alone. What is important is the reaction which the influence of a firm on its competitors brings back, neither upon its revenue, nor upon its costs, but upon its profits; and what determines a reaction from other firms is neither the influence of the first one upon their revenues, nor upon their costs, nor even upon their profits, but upon the advisability of modifying their price-output decisions.[24] In equilibrium these firms are unable to increase their profits by adopting a different price-output level, *i.e.,* $\frac{\delta \pi_j}{\delta p_j} = \frac{\delta(R_j - C_j)}{\delta p_j} = 0;$[25] where π indicates profit, p price, R total revenue and C total cost. Whether or not they will "react" to a change in p_i depends on the influence of that change on the possibilities of profit maximization indicated by the coefficient $\frac{\delta \pi_j}{\delta p_j}$. The total situation would thus be revealed by the use of the following coefficients:

(1) $\frac{\delta \pi_i}{\delta p_j}$ or $\frac{\delta \pi_i}{\delta q_j}$, indicating whether or not the firm i is influenced by the price-output decisions of other firms j;

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[24] This statement of the problem and the ensuing analysis presuppose that each seller analyzes correctly his market position. We might repeat here the qualifications mentioned on pp. 62–67 with respect to a different problem.

[25] A similar analysis could be conducted in terms of $\frac{\delta \pi_j}{\delta q_j}$, instead of $\frac{\delta \pi_j}{\delta p_j}$; q_j represents the amount of product turned out.

$$(2) \quad \frac{\delta}{\delta p_i}\left(\frac{\delta \pi_j}{\delta p_j}\right)^{26} = \frac{\delta}{\delta p_i}\left(\frac{\delta R_j}{\delta p_j} - \frac{\delta C_j}{\delta p_j}\right)$$
$$= \frac{\delta^2 R_j}{\delta p_j\,\delta p_i} - \frac{\delta^2 C_j}{\delta p_j\,\delta p_i} = \frac{\delta^2 \pi_j}{\delta p_j\,\delta p_i},$$

expressing whether or not the firm i influences these price-output decisions of firms j.

The oligopolistic problem will arise if both of these coefficients are different from zero.[27]

The reader who finds comfort in graphic illustrations may easily reinterpret the explanations given above about inter-
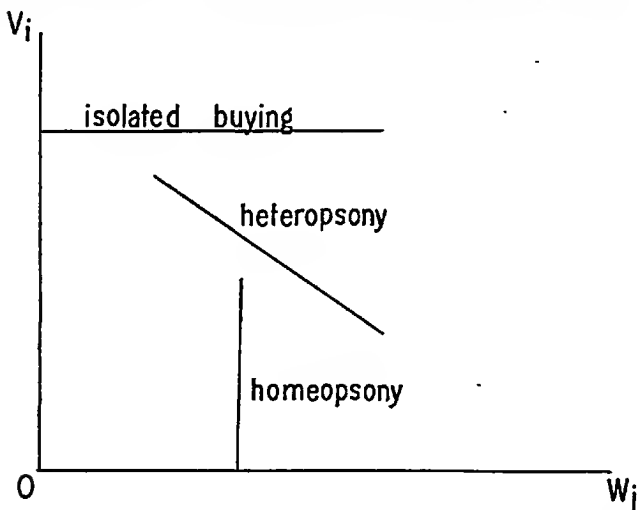
FIGURE IV

dependence in selling, and apply them to Figure IV, which exhibits the various cases of cost interdependence.

[26] or $\dfrac{\delta}{\delta q_i}\left(\dfrac{\delta \pi_j}{\delta q_j}\right)$, or $\dfrac{\delta}{\delta p_i}\left(\dfrac{\delta \pi_j}{\delta q_j}\right)$, or $\dfrac{\delta}{\delta q_i}\left(\dfrac{\delta \pi_j}{\delta p_j}\right)$.

[27] Oligopolistic difficulties on the cost side would also arise in the highly hypothetical case where, although the second coefficient might be 0, the firm i, with-

3. INTERDEPENDENCE AND THE PROBLEM OF ENTRY

The interdependence of the firms may be discussed from a third point of view: the closing down of existing firms, and the establishing of new ones. The traditional treatment of the problem is little more than a caricature. The conventional dichotomy between closed and free entry perpetuates in this region of value theory the artificial cleavage that, in other fields, monopolistic competition seeks to bridge. Free and closed entry are, like pure competition and pure monopoly, merely the extreme limits between which lie the actual cases in the real world.

In addition, the matter is obscured by the strong association of the theory of entry with the question of profits and with the discredited group concept. To carry to its logical conclusions the work initiated by monopolistic competition theories, we must bridge the gap between closed and free entry, and restate the problem in terms of heterogeneous competition, excluding any reference to groups or industries undefinable under conditions of product differentiation. The discussion will proceed in three stages:

(1) is firm i affected by the appearance or disappearance of other firms j?

(2) can firm i influence such appearances or disappearances?

(3) if both questions are answered in the affirmative, an oligopolistic type of interdependence is seen to arise again; will profits or prices be the main channel of oligopolistic policies?

A. SENSITIVENESS TO ENTRY

We might first assume that the firm i under consideration is completely unaffected by the appearance or disappearance, of other firms j. This would require that i and j be perfectly isolated both as buyers and as sellers.[28] If the inclusiveness of

out influencing the price-output decisions of j, would have an influence on the proportion of the various factors used by j, and at the same time, the latter proportion would react on the price paid by i for its own factors, or on the revenue received by i from its sales.

[28] Cf. above, pp. 98–116. For the sake of completeness, we might also

the symbol j be sufficiently extended, the extreme case could be defined where i would remain perfectly indifferent to any appearance or disappearance of firms. The case must be conceded to be fantastic; unreal as it is, it nearly coincides with the traditional treatment of closed entry. Under closed entry assumptions, no firm is allowed to enter the group or industry; at the same time, particular equilibrium methodology bars the consideration of any influence exerted by firms outside the industry.[29] The practical result is to make firm i perfectly independent of the appearance of new firms, and to effect a tremendous, if artificial, simplification in the statement of value theory.

In general, however, it will be admitted that entry is never closed in this extreme sense, and that no firm can be deemed perfectly indifferent to the creation, or to the closing down of other enterprises. These other enterprises may be of two kinds: they may compete with the first firm on a homogeneous or a heterogeneous market. Free entry is usually understood to refer to the entry of *homogeneous* competitors, *i.e.*, firms offering an "identical product." Strangely enough, this view persists even in early discussions of entry under monopolistic competition. To my knowledge, Professor Chamberlin is the only one to have reconsidered his original position on the matter, and to have denounced the incompatibility between "homogeneous entry" and "heterogeneous competition," or, to use his terminology, between "full freedom of entry" and "product differentiation": "Mr. Kaldor has rightly pointed out that the assumption that 'entrance to the field in general and to every portion of it in particular was unimpeded' implies that 'every producer *could*, if he wanted to, produce commodities completely identical to those of any other producer. . . .' Logically, this is what 'free entry' in its fullest sense must mean, and it is quite incompatible with a differentiated product. With respect to the *particular product* produced by any individual

firm under monopolistic competition, there can be no 'freedom of entry' whatever. No one else can produce a product identical with it, altho he may be able to produce others which are fairly good substitutes for it." [30]

Indeed, the threatened entry (or exit) of firms "offering an identical product," *i.e.*, in our terminology, of "homogeneous competitors" would obviously take us away from heterogeneous into homogeneous competition. As Professor Chamberlin suggests, a second type of entry may be assumed which is perfectly compatible with product differentiation: this is "heterogeneous entry," *i.e.*, the freedom of producing more or less imperfect substitutes, of producing commodities that will be in heterogeneous competition with the commodity sold by the firm under consideration. "Under monopolistic competition, then, there can be freedom of entry only in the sense of a freedom to produce substitutes; and in this sense freedom of entry is universal, since substitutes are entirely a matter of degree." [31]

B. THE INFLUENCE ON ENTRY

Thus, in general, the firm i has to take into account the effects on its profits of the possible appearance and disappearance of other firms j, in homogeneous or heterogeneous competition with itself. Conversely, do the profits of i influence the creation, or closing down of such firms j? The traditional theory of profit and of the number of firms is built up on the assumption of such an influence. The existence of large profits is supposed to attract new firms into the field; the prevalence of losses, to drive some firms to close down their plants and leave the field; profits are defined as normal when, despite freedom of entry, the number of firms tends to remain stable.

Indeed, it was admitted all the time that when entrepreneurs

[30] E. H. Chamberlin, "Monopolistic or Imperfect Competition?" *Quarterly Journal of Economics*. LI (1937), 566–567. Cf. also the ensuing discussion with Mr. Kaldor in N. Kaldor, "Professor Chamberlin on Monopolistic and Imperfect Competition," and E. H. Chamberlin's "Reply," *Quarterly Journal of Economics*. LII (1938), 513–538, especially 522–525, and 535–536.
[31] E. H. Chamberlin, *ibid.*, p. 567.

create new firms, it is because of the profit possibilities they perceive for themselves, and not because "their mouths water at the sight of the high profits of the existing firms." [32] "The enjoyment of large profits by any particular firm is evidently an indication that others, by producing close substitutes, may be able to compete some of them away." [33]

The indication is pretty accurate under the traditional assumption of free entry, in the fullest sense of the term, *i.e.*, when competitors are able to arise and produce, at the same cost as firm i, a commodity economically homogeneous with the one produced by i. Both elements, of cost identity and product homogeneity, are necessary to the definition. I propose to reserve the term *free entry* for this extreme case, since in fact many of the results traditionally associated with free entry are valid only when free entry is so defined. The possibility of producing an identical good, but at a cost which may be superior, may be termed *homogeneous entry*; and the freedom to produce imperfect substitutes, *heterogeneous entry*.

In the general case, the new firms do not meet both of the provisos required for free entry, and the profits of existing firms are, at the most, an indirect and very hazy indication of the profit opportunities open to newcomers. The indication will be more and more indirect, less and less reliable as one goes farther away from the two conditions of cost identity and product homogeneity. New competitors may cease to arise long before the profits of existing firms have been competed away; on the other hand, they may also keep coming in long after existing enterprises have seen their profits dwindle and be converted into losses.

The firm i, however, may have other ways of influencing the entry or exit of competitors. Unconsciously at least, every firm plays its part, in combination with all other firms, in moulding the economic circumstances that will make it profitable for new firms to engage in some types of activity, and

[32] Robinson, p. 92.
[33] E. H. Chamberlin, "Monopolistic or Imperfect Competition?" *Quarterly Journal of Economics*, LI (1937), 568.

for old firms to desist from their present sphere of production.
When the firm i has by itself a sufficient influence to induce
such creations or disappearances of firms j (or when it com-
bines with others to attain the same result),[34] the oligopolistic
difficulty again reappears, if the firms j conjured into, or out
of, existence have themselves an influence upon i's profits.

C. OLIGOPOLISTIC INTERDEPENDENCE AS TO ENTRY

This aspect of oligopolistic indeterminacy has received scant
attention in economic literature. This neglect is understand-
able if one reflects that the most frequent assumptions of clas-
sical theory shut out the problem entirely. There is room for
it neither under monopoly (when combined with particular
equilibrium methodology), nor under closed entry nor under
pure competition. Even monopolistic competition will be free
from it, under the assumption of large numbers. Monopoly
and closed entry protect the firm i from the rivalry of new
competitors. Pure competition, or simply large numbers, ex-
clude any significant influence of i upon the entry or exit of
other firms.

The introduction of product differentiation or heterogeneity
extends enormously the scope of the problem, since each seller
will have a strong interest in preventing, if possible, the emer-
gence of a competitor selling a product very close to his own,
and competing with it much more than with the products of
other sellers.[35] Oligopoly in entry is also inextricably mixed

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[34] Mrs. Robinson assimilates this case to arbitrary restriction of entry by a
licensing authority. "It is possible, of course, that the number of firms may be
arbitrarily restricted. The firms may require a license from some controlling
authority, or the existing firms may be so strong that they are able to fend off
fresh competition by the threat of a price war. They may even resort to vio-
lence to prevent fresh rivals from appearing on the scene. . . ." J. Robinson,
"What is Perfect Competition?" *Quarterly Journal of Economics*, XLIX (1934),
107. Cf. above, p. 47.

[35] Mr. Kaldor has rightly emphasized difficulties of this kind in "Market
Imperfection and Excess Capacity," *Economica*, II (1935), 33–50, especially
pp. 37–40. Cf. also A. P. Lerner and H. W. Singer, "Some Notes on Duopoly
and Spatial Competition," *Journal of Political Economy*, XLV (1937), 145 ff.

Obvious examples could be drawn from the field of local competition. Oli-
gopolistic elements would inevitably arise (and modify the solution offered) in
the situations treated, *e.g.*, by Professor Hotelling in "Stability in Competition,"

up with oligopolistic relationships between actual competitors, since driving the rivals entirely out of the field — the "cut-throat competition" policy — may be a frequent aim of the oligopolist.

In all these cases, however, it is more apparent than ever that the level of profits is not a strategic element in the situation. If one of our usual variables deserves to be picked out as being especially significant in such a fight, it will be prices, not profits.

First of all, it is clear that so far as *exit* of firms is concerned, the profits or losses of i are of no importance in the decisions of the firms j: the firm i would fool no one by foregoing profits, for the firms j that i tries to influence are actually in business and know very well, without looking at i's profits, how much profit they are making.

Secondly, if the profits of i may, in the case of *entry*, afford an indirect indication of the potential profits open to newcomers, the price charged by i is a much more direct element of appreciation. If i thought exclusively of the influence of his profits upon entry, he might, instead of lowering price and producing more than equilibrium output, fix a higher price and sell an amount lower than the equilibrium output; both procedures, indeed, reduce profit. It is clear, however, that the second one is dangerous as it makes the task easier for the competitor who does not let himself be fooled by the absence of profit in firm i.

On the contrary, fixation of low prices has a discouraging influence both upon actual and potential competitors. This influence is much more direct than the influence of the level of profit of i. It is more than a mere, and vague, indication of the profits that j might expect *if* his cost conditions are similar to i's, and *if* his entry does not shift the demand curves of all sellers too violently toward the left. It has an immediate bearing on the conditions under which j has to compete and on

his freedom to choose the price that will maximize his profit.

Finally, it must be conceded that both policies cannot be isolated: keeping prices at a level below equilibrium means that full advantage is not taken of the possibilities of profit maximization. The low price policy thus kills two birds with one stone, and permits i to reap also the eventual benefits of whatever influence the level of his profits might have in bluffing competitors into believing the field unworthy of attention.

By transferring the hinges of interdependence as to entry from profit policy to price policy, we have brought back the problem within reach of our former discussion in sections 1 and 2 of this chapter. The entry or exit, as a result of the price charged by i, of firms j influential for i, is only an extreme case of the influence of i upon the price-output policy of firms j. In sections 1 and 2, firms j only vary their price and output; now, they vary them to such an extent that they either pass from an output zero to a positive one (entry), or from a positive one to a zero one (exit).[36]

Free entry, homogeneous entry, heterogeneous entry, closed entry, all refer to empirical relationships, ascertained or assumed, between the firms. The previous analysis has shown that circular interdependence can be evaded without recourse to the extreme assumptions of absolutely free or absolutely closed entry. Indeed, these limiting cases prolong needlessly the cleavage which monopolistic competition theories seek to bridge between the pure cases of competition and monopoly. The prevalence of the assumption of absolutely free entry (through which profits of innovation are soon squeezed out of existence in the Schumpeterian analysis) [37] is to be linked with the former theory of value, based itself on the assumption of generalized pure competition.

Which type of entry prevails in any particular case is to be ascertained and "explained" by an investigation of the facts. Analytical reasoning is powerless to deduce the answer from general, universally valid assumptions.

[36] Cf. above, pp. 107–108.   [37] Cf. below, pp. 164–166.

4. INTERDEPENDENCE BETWEEN BUYERS AND SELLERS: BILATERAL MONOPOLY

There remains still another type of interdependence, the most direct of all. When a commodity is sold, sellers and buyers are linked in an immediate way since the price received by the first is disbursed by the latter.

Here again indeterminacy may arise: the case has been discussed in its most extreme form under the name of bilateral monopoly.[38] Wherever both sides of the market, conscious of their influence on prices, direct their policy to influencing price in their favor, a situation arises for which we might repeat all that was said earlier about oligopolistic indeterminacy.[39] The limited tools of pure economics are powerless to yield by themselves a determinate solution.

Consequently, when discussing the interdependence of the firms as to the demand for their respective products (section 1), we had to assume a purely competitive behavior on the part of the buyers; when discussing this interdependence as to the costs of the various firms (section 2), we had similarly to assume a purely competitive behavior on the part of the sellers of the factors. Our conclusions must be qualified accordingly. Three cases had, so far, been indicated as yielding a determinate solution: pure competition, pure monopoly (monopsony) and monopolistic (monopsonistic) competition with large numbers; or, in our terminology, pure monopoly (monopsony) and atomistic competition, no matter whether homogeneous or heterogeneous. The proviso must now be emphasized that the argument is only valid for the cases where at least one of the two sides of the market is made of units acting according to Pareto's type I, *i.e.*, taking price as a parameter of action.

Again, the problem of ascertaining whether or not this is in fact realized in most market transactions, is an *empirical*

[38] Cf. A. L. Bowley, *Mathematical Groundwork of Economics* (Oxford, 1924); H. von Stackelberg, *Marktform und Gleichgewicht* (Vienna and Berlin, 1934); J. R. Hicks, "The Theory of Monopoly," *Econometrica*, III (1935), 1–20.
[39] Cf. above, pp. 70–72.

question, and not a matter of logical deduction. It might be advanced as a tentative guess that type I behavior may often be found at least at the two ends of the scale: in the buying activity of the consumers and in the sale of factors by individual owners — *e.g.*, the sale of labor power by the laborers. In between, the existence of larger and fewer economic units (industrial firms) introduces monopolistic modes of behavior. With the growth of the size of the economic unit (firms, trade-unions, selling or buying syndicates),[40] more and more indeterminacy is introduced in the mechanism described by pure economic theory: equilibrium cannot be deduced without bringing into the picture a number of additional considerations, perfectly foreign to our traditional, "pure," analysis: the psychology of the policy-making individuals, their financial backing, business traditions, etc.[41] Side by side with our former "hydraulic" types of equilibria, there arises anew the economics of power and of the poker game.

5. What is Pure Monopoly?

In closing this chapter, it may be worth while to consider in more detail the definition of our two limiting cases: pure monopoly and pure competition.

A. The Traditional Concept of Monopoly

Three main threads make up the fabric of traditional monopoly theory. The first is the singleness of the seller in the industry, and the second is the privileged situation which protects this singleness against the invasion of new sellers; in other words, there is only one seller in the group and "entry is closed." The third aspect results from the two conditions

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[40] This movement has not been so pronounced in agriculture. It is noticeable that agricultural production (especially wheat) is generally chosen when an example of purely competitive conditions is needed.

[41] Such considerations are made the subject matter of Professor Chamberlin's section devoted to Excess Capacity: cf. Chamberlin, pp. 104–109. Excess capacity as derived in this section depends on assumptions implying a radical departure from the methodology of "pure" economics. Any conclusion drawn as to public policy must be associated with this change in assumptions, not with the particular virtues of monopolistic competition analysis.

just given: the seller is in possession of some kind of "power" which is denied to the pure competitor.

Before analyzing in a more precise manner the meaning and content of this "monopoly power," the bulk of economic theory — with the famous exception of Cournot — turned the best of its attention toward a description of the circumstances leading to such power. Old textbooks are full of explanations about coalitions, corners, legal privileges, etc., through which the seller attains or protects his monopolistic situation.[42]

The problem of monopoly, however, was also treated by the pure theory of equilibrium and a solution was developed in terms of the three main variables of equilibrium economics: cost, price, output. As time elapses, one finds more and more insistence on this aspect of monopoly and on the influence which the firm can have upon price through variations in its output.

B. RECENT TRENDS IN MONOPOLY THEORY

And so a second type of monopoly theory develops where the former, and still popular, criterion of singleness is replaced by the more elaborate concept of an inelastic sales curve for the firm.

This is the meaning of Pareto's distinction between type I and type II. We are dealing with a competitive situation if the sellers "accept the market prices as they are, and do not try to modify them directly, although they modify them indirectly without aiming at it or without knowing it." People acting according to type II "can and are consciously trying to modify directly these prices."[43]

The Paretian theory of monopoly, however, never cut loose entirely from the second tenet of the traditional definition: monopoly is constantly associated with closed entry and with supernormal profits. The final break was made by Mrs. Robinson and the English theorists of imperfect competition. Mrs. Robinson's own definition of monopoly was rather startling.

[42] Cf. *e.g.. Manuel*, pp. 166–167.

[43] *Economie Mathématique*, p. 623 (my translation). Cf. above, pp. 55–56.

A monopolist, to her, is an individual producer under any circumstances whatsoever, not even excluding perfect competition.[44] This very originality prevented her concept from gaining any acceptance at all. In fact, I suspect that most readers overlooked the peculiar trait of her definition and unconsciously substituted for it the one, popularized at the time by other English writers, of a seller with an imperfectly elastic sales curve. Mr. Lerner, *e.g.*, defines as a monopolist any seller "confronted with a falling demand curve for his product. . . ."[45]

Mrs. Robinson, however, having rewritten "the theory of value, starting from the conception of the firm as a monopolist,"[46] had called the result *The Economics of Imperfect Competition.* This probably explains why imperfect competition was interpreted by economic theorists, in England at least, as a mere restatement of monopoly analysis, supplemented by an investigation of the competitive relationships between the monopolists. As Mr. Kaldor puts it, "the old theory of monopoly . . . is revealed, in the light of more recent theory, as a doctrine relating merely to a *single aspect* of 'monopolistic competition.'"[47] Thus, Mr. Kahn calls imperfect competition what Mr. Lerner designates as monopoly.[48] Imperfect competition comes to embrace, under one inclusive

[44] Along with this "logical" definition, on which her "book is based" Mrs. Robinson retains the Marshallian definition of monopoly as control over the supply of a whole industry. On all this, I refer the reader to Professor Chamberlin's discussion in "Monopolistic or Imperfect Competition?" *Quarterly Journal of Economics,* LI (1937), 574–575.

[45] A. P. Lerner, "The Concept of Monopoly and the Measurement of Monopoly Power," *Review of Economic Studies,* I (1934), 157.

[46] Robinson, p. 6.

[47] N. Kaldor, "Professor Chamberlin on Monopolistic and Imperfect Competition," *Quarterly Journal of Economics,* LII (1938), 527–528.

[48] "Competition is imperfect if . . . the demand for the individual firm is not perfectly elastic." R. F. Kahn, "Some Notes on Ideal Output," *Economic Journal,* XLV (1935), 20. In the same sense, J. R. Hicks, "Annual Survey of Economic Theory: The Theory of Monopoly," *Econometrica,* III (1935), 1–20; and N. Kaldor, *op. cit.,* pp. 515 and 526.

It must be observed, however, that Mr. Kahn himself, thinking of monopoly, not in terms of a negatively sloping sales curve, but in terms of closed entry, denies that imperfect competition carries with it "any of those implications with which by tradition the word *monopoly* is associated." Kahn, *op. cit.,* p. 20.

term, problems as different from one another as product differentiation, monopoly and oligopoly.

Among the monopolistic competition writers, Professor Chamberlin seems to be the only one who has kept without a particle of change the old traditional definition of monopoly as control over supply, merely pointing out that the word "is meaningless without reference to the thing monopolized," [49] and urging its elastic use to cover any product whatever, no matter how broadly or narrowly defined. Since any product competes, through substitution, with all other products in the economy, he is led to a definition of *pure* monopoly implying "control of the supply of all economic goods." [50] This latter concept, however, plays no part in his analysis, being mentioned only in passing, as descriptive of a theoretical limit. The concept to which reference is usually made is simply the traditional one. Professor Chamberlin insists that the theory of monopoly that flows from it is neither coextensive with monopolistic competition nor completely distinct from it. It is only a portion of the whole field of monopolistic competition, and embraced within it. [51]

Dr. Paul Sweezy has recently proposed a new definition of monopoly, distinguishing it clearly and definitely from the category of monopolistic competition (and of oligopoly). His approach has the further merit of leaving entirely aside the

[49] Chamberlin, p. 65.

[50] Chamberlin, p. 63. Mr. Kaldor fears that Professor Chamberlin's classification of actual cases between the two limits of pure monopoly and pure competition "would lead to the absurd conclusion of regarding the limiting case of 'pure monopoly' as one where the elasticity of demand is zero. . . ." (Kaldor, *op. cit.*, pp. 526-527.) Such would be, indeed, the logical outcome of Mr. Kaldor's definition of imperfect competition in terms of the elasticity of the sales curve. Professor Chamberlin, however, does not use that criterion in any of his definitions: just as he does not define pure competition in terms of a perfectly elastic sales curve, but rather deduces such a curve from a more basic definition, so he does not define monopoly in terms of a less than perfectly elastic sales curve. According to his definition, the pure monopolist's sales curve would have an elasticity, not of zero, but of one; or rather—a sales curve for such a conglomerate being really undefinable—his revenue could neither be decreased nor increased as a result of price changes because there would exist no alternative outlet for the income of the buyers.

[51] Chamberlin, pp. 68 and 74.

old concepts of industries and numbers.[52] According to his definition, a seller is to be considered a monopolist if his sales curve be independent both of the price he charges and of the profits (or losses) he makes. Under this cumbersome formulation, I think what Dr. Sweezy's requirements define is not monopoly but merely the exclusion of oligopolistic interdependence both as to demand and as to entry.

As Dr. Sweezy sees it, the significance of his definition is to exclude for the seller any need to bother about a "group problem," *i.e.*, about the reactions of other sellers; he can determine a price that maximizes his profit, without having to inquire whether his profits will attract new competitors, or his price changes induce others to modify their own prices. This indifference to the others can be due to one, or both, of the following circumstances: (1) that the entry of new firms, or the price changes by other firms, do not affect the level of the monopolist's revenue, or rather of his profits, which corresponds to my own definition of pure monopoly; (2) that the seller, although affected by others entering the field, or changing their prices, is himself powerless to induce or prevent such moves. The latter corresponds, so far as prices are concerned, to Professor Chamberlin's definition of large numbers. If, in addition, we admit the contention defended above [53] that the profits of any single seller have generally little influence, especially in the "large number" case, upon the entry of new competitors, it is seen that monopolistic competition of the most simple brand [54] unwillingly becomes, at the hand of Dr. Sweezy, a case of monopoly, as distinct from monopolistic competition. Monopolistic competition, in Dr. Sweezy's classification, would require "large numbers" plus influence of the seller's profits upon the entry of competitors.

Even pure competition, in the Chamberlinian or Robinsonian sense, would fulfill Dr. Sweezy's definition of monopoly, since

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[52] P. M. Sweezy, "On the Definition of Monopoly," *Quarterly Journal of Economics*, LI (1937), 362–363.

[53] Cf. above, pp. 121–123.

[54] Such as forms the main topic of Professor Chamberlin's exposition, on pages 71–100 of his book.

the pure competitor has no influence upon the level of prices (and thus upon his own sales curve) or upon the entry of additional competitors.

Anyone may, of course, choose his definitions as he pleases, and it would be useful to have a name (I use, in this book, the term *atomistic*) to designate the general case of absence of oligopolistic interdependence. I doubt, however, whether the word monopoly is well chosen for the purpose, since a definition of monopoly so inclusive as to embrace pure competition itself conflicts too violently with traditional thinking and terminology.

C. A NEW DEFINITION

Pure monopoly, as I have defined it above, constitutes, I think, the most logical translation into general equilibrium terms, of both the Marshallian theory of monopoly, and the popular concepts based on absence of competition, or singleness of the seller.

In particular equilibrium analysis, the effect of monopolistic assumptions is to provide the theorist with a stable demand curve for the product of an individual firm. The demand curve expresses a two-variable relationship between the price and output of a commodity, for a given value of all other prices.[55] But, under particular equilibrium methodology, this proviso has very different implications in the case of a firm and in the case of an industry.

The demand curve of a firm — its "sales curve" — is intimately linked with the level of the outside parameters: the firm is confronted with a price which is directly dependent on (and, under pure competition, is even identical with), the prices charged or obtained by the other firms in the industry. Every change in these other prices shifts the demand curve of the individual firm. In fact, Marshall does not even draw such a curve; the intensive use made of it by Professor Chamberlin and Mrs. Robinson should not blind us to the fact that the de-

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[55] Mrs. Robinson breaks on this point with the Marshallian tradition; cf. above, pp. 44–46 and 68–70.

mand curve of the firm does not, in reality, have all the characteristics of the traditional demand curve of the industry.

The latter curve expresses the relationship between demand and market price for the undifferentiated product of a whole group of firms, the prices of all other commodities outside the industry being again fixed at a given level. But particular equilibrium economics limits its inquiry to the realm of the industry itself, and ignores the changes in the outside world, and in the outside prices. Thus, within the boundaries of particular equilibrium economics, the demand curve of the industry assumes a stability denied to the demand curve of the firm. It serves as a bulwark against the forces of outside competition and of general economic interdependence, a bulwark behind which particular equilibrium economics can develop its value theory in peace and quiet.

The real significance of the traditional monopoly case — the singleness of the seller — is to identify a firm with an industry and thus to substitute for the shifting demand curve of the former the stable demand curve of the latter. It is in this sense that monopoly means the absence of competition: whatever the changes in the price (or output) of other sellers, the monopolist remains unaffected; the equilibrium problem in the case of a monopoly stops with the equilibrium of the firm.[56] The existence of competing products is taken into account in the negative slope of the sales curve, but has no further influence on the situation. Our own definition merely translates these requirements into general equilibrium terms, without the intermediary of the group concept.

In perfect agreement with the analysis of monopoly by particular equilibrium theorists, our definition is also in keeping with the popular tradition which makes monopoly the exact "antithesis of competition."[57] Our coefficient of interdependence measures the relative share of monopoly and competition in the situation of the seller. In the ideal case of pure competi-

[56] Cp. Chamberlin, pp. 68–69.
[57] Chamberlin, p. 63.

tion, the coefficient reaches the value of infinity, and monopoly is entirely squeezed out. In the same measure in which our coefficient indicates a loosening of the competitive ties, it also indicates a growing strength of the monopoly element. When, at the other end of the scale, the value zero is attained, competition is entirely driven out, and we have pure monopoly, exclusive of any kind of competition, heterogeneous or homogeneous.

Is it true, as Mr. Kaldor contends, that such a case not only does not exist, but that it "is not even conceivable, since it would conflict with our basic assumptions about the nature of human wants"? [58] Is it, for instance, inconceivable to imagine a commodity which is neither complementary to, nor competitive with other goods, except for the universal competition of all goods for the consumer's dollar? Only one additional assumption is needed: that the demand curve for this good (or for all other goods) be of unit elasticity, so that the revenue of a monopolistic seller will be independent of all other prices, and we have our definition of pure monopoly. [59] The assumptions are totally unrealistic, but I do not see that they "conflict with our basic assumptions about the nature of human wants."

Professor Chamberlin's pure monopoly constitutes another example of an institutional setup satisfying the conditions by which our own coefficient defines pure monopoly. The universal, all-inclusive control exercised by the seller explains *why* the value of the coefficient is zero. Our definition thus includes the pure monopoly of Professor Chamberlin as a special case;

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[58] N. Kaldor, "Professor Chamberlin on Monopolistic and Imperfect Competition," *Quarterly Journal of Economics*, LII (1938), 526.

[59] Cp. Piero Sraffa, "The Laws of Returns Under Competitive Conditions," *Economic Journal*, XXXVI (1926), 545. Mr. Sraffa defines as "absolute monopoly" the case in which "the elasticity of demand for the products of a firm is equal to unity; in that case, however much the monopolist raises his prices, the sums periodically expended in purchasing his goods are not even partially diverted into different channels of expenditure, and his price policy will not be affected at all by the fear of competition from other sources of supply." This would be expressed by $\dfrac{\delta R_i}{\delta p_i} = 0$, as compared with our definition $\dfrac{\delta R_i}{\delta p_j} = 0$.

ours is an analytical definition, not an institutional description of a singular instance.

It must be admitted at once that the assumptions needed actually to realize monopoly in its pure form, are quite fantastic. Indeed, pure monopoly is unlikely ever to be realized, at least in an individualistic economy. The value of the concept is not that it describes what should be considered as a typical case, but that it serves us to isolate in its purest form a tendency, more or less active, but never completely exclusive in any concrete situation. Pure monopoly defines a limiting case, not a typical one: it is a limit which is only approached by the monopolies of the real world. The real world is a world of imperfect substitutes, of heterogeneous competition, bounded by homogeneous competition at one pole, pure monopoly at the other.

6. WHAT IS PURE COMPETITION?

The concept of competition has undergone in economic science a process of evolution more or less parallel to the evolution of monopoly. The analytical significance of competition is slowly emerging out of a long series of controversies during which attention was often directed toward the results of competition, or its prerequisites, rather than toward the significant elements in its definition proper.

A. RECENT TRENDS IN THE THEORY OF COMPETITION

There is, today, general agreement upon the concrete circumstances which are prerequisite to the functioning of pure competition. Professor Chamberlin asks: (1) that the number of buyers and sellers be large "so that the influence of any one or several in combination is negligible"; (2) and that an identical good be offered by all the sellers.[60]

Similarly, Mrs. Robinson requires: (1) "the existence of such a large number of producers that a change in the output of any one of them has a negligible effect upon the output of

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[60] Chamberlin, pp. 7–8.

the commodity as a whole"; and (2) that the market be "perfect." [61]

If "perfection of the market" is identified with "identity of the product," there is complete agreement between the two authors.[62]

This agreement is most interesting to us, as the two requirements indicated by Mrs. Robinson and Professor Chamberlin point directly toward the two elements in our own definition of pure competition. The "identity of the product" expresses in descriptive terms an idea exactly defined by our "product homogeneity" through the value ∞ of our coefficient of interdependence $\dfrac{p_j\, \delta q_i}{q_i\, \delta p_j}$. Similarly, the "large number of sellers" aims at ruling out oligopolistic relationships, but can give only a presumption in this respect; we come to a correct answer by calling in our second coefficient, $\dfrac{q_i\, \delta p_j}{p_j\, \delta q_i}$. Let us remark incidentally that the substitution of this second coefficient for the "large number" criterion frees the analysis of the artificial symmetry inseparable from the criterion of numbers.[63] Among homogeneous competitors, some big firms may be in oligopolistic competition, while minor enterprises have to accept the price resulting from the oligopolists' decisions as a parameter of action. The Robinsonian and Chamberlinian "requirements" are merely a simplified description of a concrete combination of circumstances, most likely to give rise to the type of market relationship implied in pure competition and defined analytically through the use of our two coefficients.

Another aspect of the theory of competition has been largely cleared up in recent discussions. It is the social value of pure competition.

[61] Robinson, pp. 88–89; cf. also "What Is Perfect Competition?" *Quarterly Journal of Economics*, XLIX (1937), 104–120.

[62] Cf. above, pp. 40–41; and E. H. Chamberlin, "Monopolistic or Imperfect Competition?" *Quarterly Journal of Economics*, LI (1937), 568–570.

[63] Cf. above, pp. 99 and 102.

For the man in the street, competition still represents, above anything else, a social norm for economic relationships. This attitude had long been encouraged by economic theory. Pareto even gave it a rigid analytical garb by proving that free competition in exchange (and also, with some qualifications, in production) would maximize ophelimity for all the individuals in the economic collectivity.[64]

This general blessing of pure competition is, in economic theory, linked with results long attributed to competition, and to competition alone: a profitless production, working at minimum unit costs.

The first aspect, the elimination of (supernormal) profits, plays a dominant role in the Paretian system of equations. In the competitive case, the equality between revenue and cost constitutes one of the systems of equations by which equilibrium is defined. When we pass from competition to monopoly, the whole system disappears and additional equations are needed to determine the extent of the difference between cost and revenue, *i.e.*, the monopolist's profit.[65]

In recent years, the presence or absence of profits has been detached from the distinction between monopoly and competition and has been connected instead with the problem of entry.[66] It should be remembered that Walras had explicitly warned his readers that his treatment of free competition rested on the assumption of *free entry*.[67] Pareto is not as insistent

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[64] *Manuel*, pp. 617-631, 639-657, and 666-671. The thesis defended by Pareto is best summarized by this statement in Pietri-Tonelli, p. 289: "Dans l'hypothèse de la libre-concurrence et des prix constants et en l'absence de frais généraux, les équations qui déterminent l'équilibre de l'échange et de la production, déterminent aussi le maximum d'ophélimité pour tous les sujets économiques de la collectivité."

[65] *Manuel*, pp. 611 and 613-617. Mrs. Robinson attributes similar views to P. Sraffa, G. F. Shove and R. F. Harrod: cf. J. Robinson, "What is Perfect Competition?" *Quarterly Journal of Economics*, XLIX (1934), 104-106.

[66] Cf. Mrs. Robinson's article just quoted and E. H. Chamberlin, "Monopolistic or Imperfect Competition?" *Quarterly Journal of Economics*, LI (1937), 566. Professor Machlup suggests that we keep the name "perfect" to designate the absence of profits and the name "pure" to designate the infinite elasticity of demand: F. Machlup, "Monopoly and Competition: A Classification of Market Positions," *American Economic Review*, XXVII (1937), 445-451.

[67] "Notre démonstration repose . . . sur le nivellement du prix de vente

on this point, but it is obvious that his technical definition of competition — type I behavior — does not imply in any way free entry or the absence of profit. The traditional theory of competition was built up on two independent assumptions, needlessly jumbled together: the lack of influence of the seller upon his price, and free entry. Modern theory has isolated the first assumption in its definition of pure competition.

There is, however, a tendency to cling to the second of the traditional "advantages of competition": the establishment of individual levels of output such as minimize unit costs. Production, under pure competition, is supposed to be carried on, at the minimum point of the U-shaped average cost curves of the firms, while, under monopolistic competition, individual outputs stop short of the point at which full advantage is taken of the "economies of large scale." In fact, however, the equilibrium of pure competition implies production at minimum unit costs only as long as profits are absent. If the firm is making a profit, production will be carried beyond the point of minimum cost; if it is producing at a loss, it will be at less than the minimum cost level of output.[68] Thus the liberation of pure competition from the assumption of free entry and profitless production should also imply the holocaust of the cost-minimizing theorem. Pure competition becomes purely a market phenomenon, stripped of its main social and normative claims.

In contemporary theory, this market phenomenon is predominantly defined by the infinite elasticity of the sales curve.[69]

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et du prix de revient des produits. Elle suppose donc la possibilité de l'affluence des entrepreneurs vers les entreprises en bénéfice comme de leur détournement des entreprises en perte." Walras, pp. 233–234.

[68] In the first case, the positively sloping marginal cost curve cuts the horizontal price line (average and marginal revenue) to the right of the point of minimum cost, the latter point being situated below the price line. In the case of losses, the marginal cost curve cuts the price line before reaching the minimum point of the average cost curve (situated in its entirety above the price line) and thus, the marginal cost curve being positively sloping, to the left of it.

[69] Cf., e.g., J. Robinson, "What is Perfect Competition?" *Quarterly Journal of Economics*, XLIX (1934), 104–120, especially p. 112; R. F. Kahn, "Some Notes on Ideal Output," *Economic Journal*, XLV (1935), 1–35, p. 20; and J. R. Hicks,

Or, to put it in terms of the behavior of the entrepreneur, there is pure competition if the entrepreneur equates marginal cost to *price*, which in this case is practically identical with marginal revenue.[70]

B. A NEW DEFINITION

First of all, we must remark that wherever there is pure competition, a number of relationships may be found that are a necessary result, prerequisite, or accompaniment of pure competition. A good definition, however, must do more than describe circumstances correlated with the phenomenon to be defined. A definition of pure competition must direct our attention toward the essential constituent of the competitive mechanism. Should we regard the elasticity of the sales curve as the basic characteristic of competition?.

To anyone coming to the problem with a fresh mind, it would seem that the existence of pure competition is a problem that transcends the boundaries of the individual firm's analysis: competition is a problem in the relationship between firms. It is rather puzzling to reflect that the elasticity criterion prevalent today makes no reference to firms' interrelationships.

Pure competition as I define it involves an elastic sales curve as one of its results. Inversely, the presence of an elastic sales curve is no sufficient proof of the existence of pure competition in our sense. We might imagine a seller completely isolated from any kind of competition from rival sellers (a pure monopolist according to our criterion $\dfrac{p_j \, \delta q_i}{q_i \, \delta p_j}$) who still would find his sales curve perfectly elastic: owing to traditionalism or stubbornness on the part of the buyers, he might be forced to sell at a customary price, let us say ten cents, whatever the price of the other commodities. Any price increase would drive away all the buyers, while, in his range of opera-

tions,[71] no expansion of output need entail any decrease in the price. The question whether or not such a case exists in practice is immaterial. The simple fact that it is conceivable shows that pure competition cannot reside essentially in the elasticity of demand for the product of a single seller. This elasticity may very well be a good indication that the presence of pure competition is to be suspected: it is no decisive proof of its existence and, even less, a definition of it.

The essential elements in the definition of pure competition seem to me to be the perfect dependence of the firm's sales upon the price charged by other sellers (homogeneous competition) plus the inability of the firm to influence the price decision of these sellers (pure competition as against oligopoly). Both of these circumstances are covered by our criteria $\frac{p_j \delta q_i}{q_i \delta p_j}$ and

$\frac{p_i \delta q_j}{q_j \delta p_i}$.

The rigid price link, characteristic of homogeneous competition, does not necessarily imply identity of prices between the competing products. To start with a simple example, let us imagine two kinds of iron ore: type I contains 70% of mineral, type II 50%. The unit price (per ton) will not be the same, and yet competition between the two will probably be homogeneous according to our coefficient. The example reveals the arbitrariness of any figure expressing unit price. In this case, neglecting incidental expenses connected with the difference in handling costs, it would be enough to quote prices not on the basis of weight, but on the basis of iron content, in order to bring into the open the identity between unit prices, usually associated with pure competition. It is, however, clear that the method of price quotation does not change anything essential to the underlying market situation.

A second example will carry our point further. In some manufacturing processes, materials of an extremely different physical description may be used to the same effect and, there

being no common quantitative unit of measurement, there can be no question of identity of unit price. Moreover, in order to compute their relative value to the firm, complex calculations might be needed since some rearrangement of the firm's machinery would probably be involved in passing from the use of one of the materials to the use of the other. From a long run point of view, the situation nevertheless exhibits all the essential characteristics of homogeneous competition. At a critical point, a slight change in relative prices will lead to a total shift in demand from one of the materials to the other.[72] The objection might be raised that in this case one of the materials will cease to be produced. This will depend on the cost conditions of the producer: either he will reduce his price so as to compete effectively with his rivals, or he will disappear from the market. What distinguishes this from a price cut which inflicts losses upon one of the producers of a given (physically identical) commodity and so induces him to give up production altogether? No doubt, the situation does not, in opposition to the former case, involve the entire disappearance of a separately named commodity; the other firms will go on producing the same good. But although the disappearance of one name from our nomenclature of products is a phenomenon that may interest the linguist, it should not detain the attention of the economist.

These examples have been given in order to disclose the fundamental nature of the concept of *economic* homogeneity underlying the cases of pure competition, oligopoly, oligopsony. We may now come down to earth and admit that, usually, homogeneity is revealed externally in the perfect similarity of the goods, and is associated with the identity of unit prices. This, however, is by no means universal or necessary. To reach a satisfactory definition of homogeneous competition, it is necessary to go beyond these frequent, but nevertheless incidental, associations, and to discover the essential character of the competitive relationship giving rise to the reactions traditionally

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[72] This is referred to in trade parlance as the "breaking point." Cf., *e.g.*, the *Institute of Scrap Iron and Steel Yearbook*. 1940, p. 3.

linked with pure competition and oligopoly. These reactions depend, not on the identity of, but on a rigid connection between, the prices of economically homogeneous goods, such as can be disclosed by the use of the coefficients $\dfrac{p_j\,\delta q_i}{q_i\,\delta p_j}$ and $\dfrac{w_j\,\delta v_i}{v_i\,\delta w_j}$.

In a sense, the traditional definitions of monopoly, oligopoly and pure competition are richer than the ones proposed here. Instead of being content with the economic characterization of the case, they take us behind the scene and show us the concrete circumstances giving birth to the type of competitive mechanism which stands to be defined. The superb indifference of the monopolist to any outside rivalry is due to his unchallenged control of a whole industry. The oligopolistic riddle is associated with the presence of only a few firms in the field. The impersonal, fatalistic, nature of pure competition is explained by the large number of small, uninfluential enterprises.

When homogeneous competition is retained, we may still avail ourselves of such "explanations." In the general case, however, it becomes impossible to describe in terms of numbers the difference between pure monopoly and heterogeneous competition on the one hand and, on the other, the distinction, within heterogeneous competition, of an atomistic, determinate case and a circular, indeterminate situation. Product differentiation destroys the concept of group and the disappearance of the group leaves no basis whatsoever for the criterion of numbers.

Economic theory may be able to reconstruct some other description of the institutional setups giving rise to its various types of competitive interdependence. I doubt, however, that it will be as simple and easy to handle as was the old one. The unique criterion of "numbers" is more likely to be replaced by more complex patterns of diverse, concrete relationships between the sellers. Such an evolution would be in line with the increasing generality of economic analysis and the growing richness of its assumptions.[73]

[73] Cf. below, pp. 188–189.

The emphasis, throughout this study, is on heterogeneity in competition. The usual assumption of identity between the goods bought or sold by different firms is ·recognized to be, from the theorist's point of view, an additional assumption, restricting the generality of the analysis. In fact, however, homogeneous competition may have a wide field of application. Only empirical investigations can decide the issue. It might be expected that a great deal of economic activity increases rather than decreases the heterogeneity of physical resources, as they pass from the raw stage into the semi-finished and finished products ready for consumption. If this generalization is accepted, the theorist may be justified in attaching more importance to monopolistic elements on the selling side rather than on the buying side of the firm's activity. This explains the prevalence, even in monopolistic competition analyses, of the assumption of a perfectly elastic supply of each factor to the firm.[74]

7. Summary

We were left, at the close of the last chapter, with new and smaller "elementary quanta" for the building of our theory of value. Instead of the vague, ill-defined, "industries" and undifferentiated "commodities" of traditional economics, we proposed to build up from the elementary maximizing units (firms and households) and from commodities narrowly and unequivocally defined with reference not to "industries," but to those elementary maximizing units.

In this chapter, the external interdependence of these elementary units has been studied, and groupings effected on the basis of a new classification of market positions. From pure monopoly (monopsony) to heterogeneous and homogeneous competition (heteropsony and homeopsony), a single coefficient has been used to distinguish systematically between the various types of market interdependence. The cases of circular inter-

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[74] Another motive is the need for a definite cost curve. We have seen that this may be reconciled with less restrictive assumptions as to the type of market situation; only oligopolistic interdependence need be excluded.

dependence (calling for additional information to supplement the usual tools of pure equilibrium analysis) were isolated by the use of a cross-classification affecting the categories of heterogeneous and homogeneous competition, and by the consideration of the indeterminacy resulting from type II behavior on both the selling and the buying sides of the market.

Finally, the new definitions of the two limiting cases of pure monopoly and pure competition were contrasted with the concepts current in traditional and in recent theories.

A NOTE ON TERMINOLOGY

The terms "heterogeneous" and "homogeneous" competition have been proposed in the previous pages, to indicate the presence or absence of "product differentiation" or "market imperfection." The "monopolistic competition" of Professor Chamberlin designates all cases where competition is not pure, owing either to differentiation or to oligopoly.[75] Mrs. Robinson's "imperfect competition" seems also to refer to both cases,[76] although she gives no explicit recognition to pure oligopoly. I reserve the term *heterogeneous competition* for the situations arising out of the differentiation of the product; while the word *differentiation* still recalls the old definitions of commodities and industries, *heterogeneous* is in keeping with a definition of the commodity with reference, not to the industry, but to the firm.

Homogeneous competition effects for pure oligopoly and pure competition the same grouping which *heterogeneous competition* does for the oligopolistic case of small numbers and the atomistic case of large numbers. The absence of any corresponding term in traditional analysis reveals the insufficient attention given up to now to the fundamental character common to both oligopoly and pure competition: the absence of product differentiation, the rigid link between the competitors' prices.

[75] Chamberlin, 3d edition, p. 9, n. 1.
[76] Cf. "What is Perfect Competition?" *Quarterly Journal of Economics*, XLIX (1934), 104–120, especially p. 112.

Traditional Terminology	Suggested Terms to Classify	
	Interdependence in Selling	Interdependence in Buying
A. PURE MONOPOLY	A. PURE MONOPOLY	A. PURE MONOPSONY
B. PRODUCT DIFFERENTIATION	B. HETEROGENEOUS COMPETITION	B. HETEROPSONY
1. *with small numbers*	1. *circular heteropoly*	1. *circular heteropsony*
2. *with large numbers*	2. *atomistic heteropoly*	2. *atomistic heteropsony*
C. ?	C. HOMOGENEOUS COMPETITION	C. HOMEOPSONY
1. *oligopoly*	1. *circular homeopoly*	1. *circular homeopsony*
2. *pure competition*	2. *atomistic homeopoly*	2. *atomistic homeopsony*

· When speaking of interdependence in buying, we had already Mrs. Robinson's word monopsony,[77] but no term to correspond to monopolistic and pure competition. In consequence, I have no hesitation in suggesting the new terms "heteropsony" and "homeopsony." If the innovation were not too radical to be easily accepted, I would like to use also "heteropoly" and "homeopoly" [78] instead of heterogeneous and homogeneous competition. This might be especially useful when one wants to indicate at the same time the presence or absence of product differentiation and the presence or absence of the so-called "oligopolistic" difficulty. The general cases of heterogeneous and homogeneous competition could then be divided into the subcases of "atomistic" and "circular" heteropoly and homeopoly. I summarize these suggestions in the accompanying table.

[77] Mrs. Robinson gives credit to Mr. B. L. Hallward, of Peterhouse, Cambridge, for coining the word from the Greek ὀψωνεῖν, *to go marketing* (Robinson, p. 215, n. 1). It must be remarked that her actual definition of a *monopsonist* is any "individual buyer," just as she refers to any "individual seller" as being a *monopolist*. Cf. Robinson, p. 215, and above, pp. 126–127.

[78] The triad would be complete if the term pure monopoly could be replaced by "heremopoly," from the Greek ἔρημος, *lone, solitary*. Etymologically, this would also be more in keeping with a definition of pure monopoly based, not on the singleness of the seller, but on his isolation from others. I fear, however, with due respect to Greek scholars, that this would be the last straw that breaks the camel's back.

CHAPTER IV

COMPETITION AND THE SHAPE OF THE COST CURVE

IMPERFECT competition, in English economic literature, evolved out of an investigation of the logical incompatibility between decreasing costs and the equilibrium of pure competition. Until now, the shape of the cost curve has remained at the center of one of the most heated controversies in the field of value theory.

While the negative (or, at most, horizontal) slope of the sales curve is never questioned, the shape of the cost curve is very much in discussion. On the other hand, the relation of competition to this shape of costs also raises some problems. In this chapter, I shall examine in succession the questions of the shape of the cost curve, and of the relation of this shape to monopolistic and to pure competition.[1]

1. THE SHAPE OF THE COST CURVE

The composite character of costs, in contrast with the case of demand, calls for a discussion of the shape of the cost curve. In Anglo-Saxon economics, "one source of confusion here has been the failure to relate the discussion to individual final products and to their process of production as a whole."[2] Economic terminology is such as to invite confused thinking on the subject. Originally derived with relation to the "industry," the vocabulary of increasing and decreasing cost (or re-

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[1] The reader who is not interested in these controversies may very well ignore this whole chapter, and proceed immediately to Chapter V, below.

[2] The quotation is from F. H. Knight, "A Suggestion for Simplifying the Statement of the General Theory of Price," *Journal of Political Economy*, xxxvi (1928), 353–370, p. 364. Professor Knight, adhering to the usual definitions of groups and commodities, does not, however, direct this attack against the discussions of the supply curve of an industry, but rather against supply curves of still larger groups, the heterogeneity of which has always been recognized: the example he gives is the question of the "supply curve" of agricultural, as against industrial, production.

turns) has come to be associated with the individual firm as well. With the growth of the firm's position in economic theory, and the elimination of the elusive concept of the industry, the real content of the old cost controversy has also, under the cloak of an unchanged jargon, shifted from the industry to the firm.

A. THE SUPPLY CURVE OF THE INDUSTRY

So far as the industry is concerned, little opposition would be raised today against Professor Schumpeter's contention that "there is no 'law of decreasing cost' of the same kind as, and symmetrical to, the law of increasing cost."[3] When the problem is stripped of "dynamic" interferences, the Austrian opportunity-cost analysis provides a strong basis for the assumption of increasing costs. In Professor Schumpeter's words, "the determinateness of static equilibrium under competitive conditions is yet a broad basic fact, and this equilibrium is stable, provided that supply price . . . is an increasing function of quantity of product. This condition rests on the fundamental fact that the extending of production by any given industry means withdrawing quantities of factors of production from increasingly 'important' other uses, which . . . is . . . the force the balancing of which against decreasing marginal utilities of product determines the distribution of resources between industries.[4] There is, it is true, an interval for practically every industry in which this condition is not satisfied, owing to the tendency which it embodies being overcompensated by fixed costs distributing themselves over an increasing number of units of product. . . . But the effect of this spends itself necessarily. . . ."[5]

Professor Knight uses the same argument in his *Risk, Un-*

[3] J. A. Schumpeter, "The Instability of Capitalism," *Economic Journal*, xxxviii (1928), 361–386; p. 366.

[4] Let us remark that decreasing marginal utility might suffice to account for the determinateness of static equilibrium; equilibrium is compatible with constant or even decreasing costs to the industry, although, under pure competition, it necessitates increasing marginal costs to the individual firm.

[5] J. A. Schumpeter, "The Instability of Capitalism," *Economic Journal*, xxxviii (1928), 361–386; pp. 365–366.

certainty, and Profit.[6] In a more recent article, however, he has argued that "under ordinary conditions the rule must be approximately constant cost."[7] The case for "approximately" constant cost is not based, however, as in the previous argument, on an inference from the determinateness of actual equilibrium, but on a direct generalization as to the "fluidity" of resources, given time for adjustments. In the same article, Professor Knight also admits that "deviations from the constant cost principle must be predominantly in the direction of increasing cost."[8] Since then, his position has shifted even more completely toward Professor Schumpeter's conclusion as to the generality of increasing cost. In classroom discussions, Professor Knight now gives more weight to the specialization of resources and to the obstacles in their transfer from one use to another. As a consequence, he now acknowledges the full impact of the opportunity-cost argument upon the shape of the supply curve of the industry and would, if rewriting his article of 1928, take a more determined stand in favor of increasing, rather than constant cost.

Professor Viner has approached the problem from a rather different angle, and has introduced more concreteness into the discussion. His emphasis is on the relationships between the supply curve of the industry, the cost curve of the firm, and the number of firms in the industry. All situations formally possible are considered and the conditions of equilibrium are stated for each case.[9]

Professor Viner, however, very carefully limits his analysis

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[6] P. 121: "The increased supply must mean a diversion of productive resources from other uses, which will raise their price in those uses through the decreased output and consequent rise in price of the competing product." Cf. also F. H. Knight, "Some Fallacies in the Interpretation of Social Cost," *Quarterly Journal of Economics*, XXXVIII (1924), 582–606; reprinted in *The Ethics of Competition* (New York, 1935); esp. pp. 226–230.

[7] F. H. Knight, "A Suggestion for Simplifying the Statement of the General Theory of Price," *Journal of Political Economy*, XXXVI (1928), 353–370; pp. 364–365.

[8] *Ibid.*, p. 359, n. 12.

[9] J. Viner, "Cost Curves and Supply Curves," *Zeitschrift für Nationalökonomie*, III (1931), 23–46. Professor Schumpeter's case is recognized under the heading of "net pecuniary external diseconomies of large scale production."

to the field of pure competition. Indeed when monopolistic competition is at stake, the whole idea of a supply curve of the industry has to be radically reconsidered.[10] I have advocated the removal of the concept of industry from the central position it used to occupy in the general theory of value. For the discussion of pure monopoly as well as of heterogeneous (monopolistic) competition, the *industry* is a useless and inapplicable device. Only the *firm's* cost curve thus remains of interest to us.

B. THE COST CURVE OF THE FIRM

1. *Formal Inferences from Equilibrium Conditions*

Even the purely formal analysis of the equilibrium of the firm implies some restrictions as to the shape of the cost curve. For the general case, the necessary condition of equilibrium $R' = C'$ (marginal revenue equals marginal cost) must be supplemented by the condition that $R'' < C''$. At the point of intersection, the marginal revenue curve must be rising less rapidly (or falling more rapidly) than the curve of marginal cost. If the output equating marginal revenue and marginal cost is to correspond to the maximization, and not to the minimization, of profit, the marginal cost curve must cut the marginal revenue curve from below. In other words, expansion of output will increase profit as long as it increases total revenue more than it increases total cost.

Under pure monopoly or under monopolistic competition, nothing more can be said; the condition stated above is the only restriction we can, from the consideration of equilibrium conditions, infer as to the shape of the cost curve. A second restriction appears in the case of pure competition. The curve of marginal revenue (equal to price) is now horizontal; for the marginal cost curve to cut the marginal revenue curve from

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[10] Cf. Robinson, pp. 86–88. Mrs. Robinson points out that not only is the price no longer uniform throughout the group, but that, in addition, changes in demand do not distribute their effect uniformly among the various producers; most of all, she insists that the fundamental relationship is now between *marginal revenue* and output, not between *price* and output. And there is, of course, no unique relationship between marginal revenue and price (such as would exist under pure competition).

below, it is thus necessary that marginal costs should be increasing. Equilibrium of the firm under pure competition is thus incompatible with decreasing marginal costs.[11]

A third restriction may be introduced, if the purely competitive equilibrium is defined in the traditional manner, as including also the condition that average cost equals average revenue (which, in turn, is equal both to price and to marginal revenue). From the combination of conditions

$C' = R' = $ the parameter p (marginal cost=marginal revenue =price),

$p = \dfrac{C}{q}$ (price=average cost),

$R'' < C''$ (slope of marginal revenue < slope of marginal cost), it follows that the average cost curve can only be tangent to the horizontal average revenue curve (sales curve) from above. This gives us the well-known U-shape of the curve of average cost. Let us insist, however, that only the addition of the no-profit assumption to the conditions for equilibrium of the firm under pure competition, imposes such a definite inference as to the shape of the cost curve. Equilibrium of the firm under pure competition requires only the hypothesis of rising marginal costs, while the assumption of monopoly or monopolistic competition is compatible with either increasing, constant, or even decreasing, marginal cost.

2. *Interpretation of the U-Shape*

In recent years, some attention has been devoted to the interpretation of the two branches of the U-shaped average cost

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[11] It is indeed odd that recent discussions of cost theory (cf. above, p. 8, n. 10) should have completely overlooked Cournot's masterly analysis of a hundred years ago: "It is . . . plain under the hypothesis of unlimited competition, and where, at the same time, the [cost] function . . . should be a decreasing one, that nothing would limit the production of the article. Thus, wherever there is a return on property, or a rent payable for a plant of which the operation involves expenses of such a kind that the [cost] function . . . is a decreasing one, it proves that the effect of monopoly is not wholly extinct, or that competition is not so great but that the variation of the amount produced by each individual producer affects the total production of the article, and its price, to a perceptible extent." Cournot, pp. 91–92.

curve. Admitting that this shape must be inferred from the formal analysis of equilibrium conditions, how are we to explain it? Why do unit costs decline at first, and then rise after a certain level of output has been reached?

Some theorists would refuse to answer such a question and would reject any *a priori* presumption that the average cost curve be horizontal.[12] Without taking sides on this issue, we may accept this prevalent prejudice for its heuristic value, as an incentive to study the relationship between costs and the size of the firm.

We have already seen that the total cost curve expresses, for each level of output, the cost of the cheapest combination of factors by means of which that amount can be produced by the firm. If that total cost were strictly proportional to output, the total cost curve would be a straight line, the curve of average cost would be horizontal.

Any departure from the horizontal may be explained either by the impact of the size of the firm's operations upon the prices of the factors it buys, or by technological reasons, or by a combination of these two sets of influences.

Any monopsonistic influence of the firm on the price of the factors it buys tends to increase unit costs as production expands. On the other hand, the growth of the firm's size may also bring into the picture these elements of indeterminacy, connected with circular competition and bilateral monopoly, which destroy, for pure equilibrium economics the definiteness of the cost curve concept.[13]

It is, however, to the technological aspects of the problem that most theorists have recourse to account for the U-shape of the average cost curve.

To isolate this second set of influences, we assume in what follows that the firm's actions have no impact on the price of the factors it buys. In this case, the cost curve would be horizontal if any desired output were produced by combining

[12] Cf. Paul A. Samuelson, "*A Comprehensive Statement of the Theory of Cost and Production*" (*unpublished*).

[13] Cf. above, pp. 108–116 and 124–125.

the various factors, following an invariable, optimal formula, in quantities proportional to the amount of product to be turned out. But, in fact, indivisibility, or lumpiness, of some of the factors prevents the optimal *available* combination from being similar at all levels of output: or, to look at it from another angle, it prevents the firm from extending to any amount of production the combination of factors which reduces unit cost to an absolute minimum.[14]

The general fact of lumpiness, however, would only account, at the most, for an undulating cost curve, with a recurrence (not necessarily with each wave) of that absolute minimum of unit cost, at those levels of output that allow for the optimal combination of factors.[15] This wave-like shape is generally ignored, after the first minimum has been reached, even if only to smooth the curve and facilitate the analysis. The controversies are concentrated around the assumption of a *unique* level of output minimizing unit cost and dividing the whole curve into two branches: one which falls and one which rises, as output increases.

The problem offers little difficulty as far as the short run is concerned. The presence of fixed factors (buildings, machinery, and so on . . .) restricts the possibility of adjustments and explains why minimum unit costs can only be realized at *one* level of output, depending on the amount of these fixed factors used.

The long run itself does not imply perfect adaptability of all the factors, but excludes only those obstacles to mutual adjustment which the passage of time can overcome. This, however, still leaves room for other obstacles to fluid adaptation, which will prevent the long-run production function from being homogeneous and the average cost curve from being horizontal. There is fairly general agreement that a minimum scale of

[14] "Absolute" by contrast to a minimum relative to the level of output. The drawing of the cost curve presupposes already that each output is produced at minimum cost. If the curve of average (or unit) cost, however, is not horizontal, this minimum unit cost varies with the level of output.

[15] Cf. M. F. W. Joseph, "A Discontinuous Cost Curve and the Tendency to Increasing Returns," *Economic Journal*, XLIII (1933), 390–398.

operations is necessary even in the long-run for optimal arrangement of the factors and a most efficient use of productive resources. The discussions are mainly terminological: while some refer to indivisibility and lumpiness, others prefer to speak of changes in "organization" which can only be effected from a certain level of output.[16]

More uncertainty surrounds the explanation of the rising branch of the cost curve. What we need here is to find a factor whose amount cannot be efficiently increased beyond a certain point, even through multiplication of plants. The more generally accepted solution is to find such a factor in the coordinating activities of the entrepreneur. When the firm expands beyond a certain size, the coordinating work cannot be fulfilled with the same efficiency, if assured by a multiplication of the number of individuals attending to the task.[17]

To conclude: even in the long run, a minimum scale of operations is required for the efficient use of certain factors; on the other hand, the coordinating tasks of management limit the expansion of the firm. This would account for the U-shape which we are forced to attribute to the average cost curve of the firm under pure, profitless competition. In addition to this, any monopolistic influence which the firm may exercise on the price of its factors (not incompatible with pure competition on the demand side) hastens and reinforces the rising tendency of the cost curve.

[16] Cf. Chamberlin, pp. 188–193; 3rd ed., pp. 202–207; Robinson, p. 333 ff.; J. M. Cassels, "On the Law of Variable Proportions," *Explorations in Economics* (New York and London, 1936), 224–225.

[17] Cf. N. Kaldor, "The Equilibrium of the Firm," *Economic Journal*, XLIV (1934), 60–76; A. Robinson, *The Structure of Competitive Industry* (New York, 1932); and "The Problem of Management and the Size of Firms," *Economic Journal*, XLIV (1934), 242–257. The amount of entrepreneurial activity required "depends on the frequency and the magnitude of the adjustments to be undertaken" (Kaldor's article, p. 70), but, as Mr. Robinson points out, only the most drastic definition of stationariness could do away with the need for such activity and render perfectly indeterminate the size of the firm.

2. MONOPOLISTIC COMPETITION AND THE SHAPE OF THE COST CURVE

A recent controversy between Professor Chamberlin and Mr. Kaldor [18] raises once more the question of the relationship between monopolistic competition and decreasing costs to the firm.

I have argued above that the firm can, under monopolistic competition, attain its equilibrium with any shape of the marginal cost curve — decreasing, increasing, or constant — while, under pure competition, equilibrium requires increasing marginal cost (and, in addition, a U-shaped average cost curve if the no-profit assumption is introduced). Mr. Kaldor repeats in his second article his previous proposition that "if full divisibility of all factors is assumed and consequently economies of scale are completely absent, the free play of economic forces would necessarily establish perfect competition.[19] From the context, however, it is clear that the contention is based on the assumption of free entry in the traditional sense. It is, of course, true that if the equilibrium of the group or industry implies the tangency of the average cost curve of each firm to its sales curve (negatively sloping under monopolistic competition), it follows at once that the average cost curve — tangent to a negatively sloping sales curve — must also be negatively sloping. But from this innocent and obvious inference, Mr. Kaldor seems to draw ethical and political considerations of ominous importance.

The economies of scale, *i.e.*, the decrease in unit costs, associated with an expansion of output, are made one of the two "causes" of monopolistic competition, and are heartily endorsed as being "purely economic causes" springing from "the condi-

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[18] Cf. N. Kaldor, "Market Imperfection and Excess Capacity," *Economica*, II (1935), 33–50; E. H. Chamberlin, "Monopolistic or Imperfect Competition?" *Quarterly Journal of Economics*, LI (1937), 557–580; N. Kaldor, "Professor Chamberlin on Monopolistic and Imperfect Competition," *Quarterly Journal of Economics*, LII (1938), 513–529, and Professor Chamberlin's "Reply," 530–538.

[19] N. Kaldor, "Professor Chamberlin on Monopolistic and Imperfect Competition," *Quarterly Journal of Economics*, LII (1938), 520.

tions of production and of consumption." The second cause is looked for in obstacles to free entry, due "to the operations of that sinister group of individuals, the 'institutional monopolists,' the owners of patent rights and of mineral springs." [20] Again and again, the contrast is reaffirmed between these two possible causes of imperfection of the market: the economic causes,[21] *i.e.*, indivisibilities, and the institutional ones, *i.e.*, the possession of "institutionally conferred privileges."

The distinction springs from a narrow and outdated interpretation of the concept of entry. If the theory of value is built up, not from industries or groups producing, *ex hypothesi*, an identical commodity, but from individual firms each of which turns out its own product, many obstacles to free entry lose the Machiavellian character they seem to have for. Mr. Kaldor, and turn out, just as the economies of scale, to be also "due to the conditions of production and of consumption." The location of a store on a busy street corner is generally a solid ground for consumers' preference. At the same time, it affords protection from additional entries. And yet, in what way is this situation more reprehensible or even simply less unavoidable than economies of scale due to indivisibility of some cost factors?

Since no two products are completely homogeneous from every point of view, what requires explanation is not their dissimilarity (this always exists, even if only in location, personality of the seller, etc.), but rather the fact that, despite their general physical heterogeneity, they may sometimes become *economically* homogeneous, making for pure oligopoly or competition. Viewed from this angle, "product differentiation" will not necessarily disappear with an increase in the number of producers. Mr. Kaldor argues that, with such an increase, the scale of operations of the individual firm becomes so small that changes of output on its part can no longer significantly

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[20] N. Kaldor, "Professor Chamberlin on Monopolistic and Imperfect Competition," *Quarterly Journal of Economics*, LII (1938), 524.

[21] The term "economic" is misleading and should be replaced by the term "technological." Institutional as well as technological circumstances are data for the economist.

affect the price of the product.[22] This is confusing two different issues: the passage from heterogeneous to homogeneous competition; and the passage, within homogeneous competition, from pure oligopoly to pure competition. The argument applies fully to the second case, but is irrelevant so far as the first problem is concerned: the seller might still be confronted with a negatively sloping sales curve, even if the whole field were so overcrowded that every man would be left with only one or two customers, most appreciative of the "product differentiation."

Mr. Kaldor's confusion probably springs from the usual definition of pure competition by the process of excluding both small numbers and product differentiation. The presence of either of these two circumstances rules out pure competition; so far, I agree with Mr. Kaldor. But this still leaves the way open for two, essentially different possibilities: pure oligopoly or heterogeneous competition. If pure competition is excluded merely because of small numbers, the result is oligopoly, not heterogeneous competition. This is perfectly clear in Professor Chamberlin's exposition. For Mrs. Robinson, however, competition is either perfect or imperfect; and imperfect competition makes no difference between heterogeneous competition and oligopoly. Mr. Kaldor's shots miss their target: they should be directed at imperfect, but not at monopolistic competition.

3. Pure Competition and the Shape of the Cost Curve

I have already quoted Mr. Kaldor's contention that "if full divisibility of all factors is assumed and consequently economies of scale are completely absent, the free play of economic forces would necessarily establish perfect competition." [23]

Far from this being the case, it can be shown that *rising* marginal costs are a necessary condition of equilibrium under pure competition, and that it is even more than a condition of

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[22] N. Kaldor, "Professor Chamberlin on Monopolistic and Imperfect Competition," *Quarterly Journal of Economics*, LII (1938), 520–521.

[23] *Ibid.*, p. 520.

equilibrium: it is a basic requirement of the definition of pure competition itself.

From the general analysis of the equilibrium of the firm, we know that the condition of profit maximization implies the intersection of the marginal revenue curve by the marginal cost curve from below ($R' = C'$ and $R'' < C''$).[24] Under pure competition, the marginal revenue curve is horizontal, being equal to the market price. For the marginal cost curve to intersect it from below, marginal costs must be increasing.

Rising marginal costs are not only a condition of equilibrium, they are indispensable to the very definition of pure competition. For competition to be pure (by opposition both to oligopoly and to heterogeneous competition), the sales curve must be so elastic that, in Mr. Kaldor's own words, "producers no longer take into account their own influence upon price and proceed to *equate* price [instead of marginal revenue] with marginal cost. . . . We can represent this situation by a 'horizontal' demand curve if we like, but this would be no more than a geometric expression of the assumption that producers take prices as given."[25]

Such an assumption, however, cannot be drawn out of nowhere. There must be some justification for such behavior on the part of the producer: the influence exerted on the price by changes in his output must be truly negligible. In all practical cases, this cannot be imagined if the range of these output changes is not restricted: the seller could not expand output indefinitely without depressing prices. In fact, there is an actual limitation to this expansion: the intersection of the horizontal curve of marginal revenue (price) by a rising curve of marginal cost, *i.e.*, an increase of total cost more rapid than the increase of total revenue.

A complete definition of pure competition thus involves, of necessity, the consideration not only of the sales curve, but also of the cost curve. The fundamental and general condition of

[24] Cf. above, p. 148.
[25] N. Kaldor, "Professor Chamberlin on Monopolistic and Imperfect Competition," *Quarterly Journal of Economics*, LII (1938), 520.

equilibrium is that the firm equates marginal cost and marginal revenue. The special case of pure competition (equation of marginal cost and price) will arise only if the firm finds that, *within the range delineated by this condition, the substitution of price for marginal revenue does not affect significantly the indications given as to which output maximizes profit.*

Another point having to do with the relevance of the marginal cost curve to the definition of pure competition may be mentioned briefly.

It has been suggested by Mr. Harrod [26] and by Mrs. Robinson [27] that, when considering the influence of a producer upon price, we should take into account the effects of the change in price upon the output of his rivals. If the latter have very elastic marginal cost curves, the slightest fall in prices would lead them to reduce drastically their output. The amount that a firm can sell without depressing prices to any noticeable extent is thus greater by the amount by which other sellers contract their own output: with very elastic marginal cost curves of his rivals, one seller's expansion would be nearly balanced by the other firms' contraction, leaving the price practically unaffected. In this way, it seems we might reach pure competition with a relatively small number of sellers.

Led on by their criterion of pure competition — the elasticity of the individual firm's sales curve — Mrs. Robinson and Mr. Harrod seem to have overlooked a vital consideration: under the setup imagined, more than one seller would reason in the way described. The outcome would again be oligopolistic, as each firm would see that its influence on price depends not only on the direct results of its own action, but also on the influence of its action upon its competitors' output. The way would again be left open for a policy of mutual bluff and intimidation, eluding the grip of pure equilibrium theory.

[26] R. F. Harrod, reviewing Professor Chamberlin's *Theory of Monopolistic Competition*, in the *Economic Journal*, XLIII (1933), 663–664.

[27] J. Robinson, "What is Perfect Competition?" *Quarterly Journal of Economics*, XLIX (1934), 117–119.

CHAPTER V

THE THEORY OF PROFIT

FREQUENT reference has been made, in the previous chapters, to the conventionalism of monopolistic competition treatments of profits and of the number of firms, in terms of free and closed entry. The time has come to approach these problems more directly and, having examined already the questions connected with the cost and revenue curves of the firm, to consider the difference between revenue and cost, the profit.

I shall not try to resurrect in these pages the earlier stages of a long controversy.[1] Building up from a few expositions more akin to the subject matter of this dissertation, I shall try to bring to the fore the two dominant characteristics of profits: dynamic in their origin, institutional in their appropriation. These will form the two sections of the present chapter.

1. A DYNAMIC INCOME

A. MRS. ROBINSON: THE THEORY OF NORMAL PROFITS

In monopolistic competition literature, Mrs. Robinson's theory of profit affords the most extreme simplification of the problem. Barring the cases where, owing to some legal provision, "there is no possibility of entry,"[2] all profits are made to be competitive, under imperfect as well as under perfect competition.

The problem of profit, to Mrs. Robinson, as to Professor Pigou and to Professor Chamberlin, is forced upon the attention of the authors by another problem: that of the stability in the number of firms composing an industry. For this stability to obtain, says Mrs. Robinson,[3] profits in the industry must be

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[1] Cf. an historical outline and a short bibliography in F. H. Knight, *Risk, Uncertainty and Profit* (Boston. 1921). Chapter II, pp. 22–48.

[2] Robinson, p. 93.

[3] Robinson, p. 94.

normal, or, in other words, average cost (normal profits being included in the cost curves) must be equal to average revenue. So far, the problem is not solved, but only deferred. There will be no tendency for the number of firms to alter if profits are normal, but when are profits normal? Strangely enough, Mrs. Robinson's answer is: when "there is no tendency for new firms to enter the trade, or for old firms to disappear out of it." [4] And, a little later,[5] she includes explicitly in the cost curves entrepreneurial as well as factorial rents.

With such a definition of normal profits nobody will dispute Mrs. Robinson's own claim that "the proposition that the industry is in equilibrium only when profits within it are normal is then reduced to a tautology." [6]

This is a fundamental flaw in Mrs. Robinson's formulation of her theory of profit and entry. The matter is in no way remedied by the distinction, made in a footnote, between "the level of profits just sufficient to maintain the existing productive equipment of an industry and the level of profits sufficient to lead to expansion." [7] It can be corrected only through a simultaneous consideration of the productivity of each factor in the alternative employments to which it could be put. Such a procedure, however, takes us into general equilibrium methodology. Mr. Shove succeeded in smuggling such contraband into Cantabrigian circles by presenting it as a "jig-saw puzzle" where "a vast number of heterogeneous individuals and activities" have to be sorted out and fitted "each into its appropriate niche." [8] In her chapter on Rent,[9] Mrs. Robinson adopts Mr. Shove's treatment and comes very close indeed to the ideas which will be developed in a later section of this chapter.[10]

[4] Robinson, p. 92.

[5] Robinson, Chapter IX, especially p. 125.

[6] J. Robinson, "Imperfect Competition and Falling Supply Price," *Economic Journal*, XLII (1932), 547.

[7] Robinson, p. 92, n.; cf. also "What is Perfect Competition?" *Quarterly Journal of Economics*, XLIX (1934), 108–111. The suggestion was originally made by G. F. Shove, "The Imperfection of the Market; A Further Note," *Economic Journal*, XLIII (1933), 119–121.

[8] G. F. Shove, "The Representative Firm and Increasing Returns," *Economic Journal*, XL (1930), 99.

[9] Robinson, Chapter VIII, pp. 102–119.   [10] Cf. below, pp. 173–178.

It must be realized, however, that the first account presented by Mrs. Robinson involves, just as did her definition of the demand curve, a circular reasoning. If the equilibrium number of firms is defined by the fact that profits are normal, normal profits cannot, in their turn, be defined by the fact that the number of firms in the industry be at equilibrium. Mr. Shove's jig-saw puzzle should not supplement, but supplant completely the analysis of profits in terms of *industrial* equilibrium.

B. PARETO: THE MONOPOLY THEORY OF PROFIT

For Mrs. Robinson, all profits were competitive; for Pareto, every monopolist receives (supernormal) profits. Indeed, this is, in his system of equations, the fundamental distinction between monopoly and competition.

Two sets of equations disappear from the Paretian system in the passage from competition to monopoly. They are: (1) the equations (D) expressing the equality of total (or average) cost and revenue. These equations depend on the "free entry" assumption, implicit in traditional "free competition" theory; (2) the equations — which Pareto calls (126) and Pietri-Tonelli (H) — determining the distribution of production between the firms in an industry; these equations formulate merely the condition that the output of each firm be such as to minimize its average cost.[11]

The second set of equations (equations H) is not replaced by Pareto in the monopoly case. There being only one firm in the *industry*, the problem which they aim to solve does not arise.

On the contrary, Pareto refuses to lose, without compensation, the set (D) in the case of monopoly. Revenue and cost being no longer equal, he reformulates the equations (D) as expressing the equality between revenue on the one hand, and on the other cost plus monopoly profits. This procedure introduces new unknowns — the profits — and Pareto, to save the determinateness of his system, tries to determine them through the introduction of a new set of equations (III) — (I)

[11] *Manuel*, pp. 332-333 and 635-636; Pietri-Tonelli, pp. 262-265.

in Pietri-Tonelli — expressing for each firm the condition of profit-maximization ($\frac{\delta \pi}{\delta p} = 0$), generally expressed today by the equality of marginal cost and revenue.[12] But these equations obviously apply (and Pareto is well aware of it)[13] to competition as well as to monopoly, and, thus, constitute no additional knowledge. In the "free competition" case, they should release us from using the set (H) which expresses a complex result. Indeed the condition stated in the equations (H) is already contained implicitly in the general condition of profit maximization when combined with the "free competition" assumptions, *i.e.*, with a horizontal sales curve *plus* free entry (or the equality of total cost and revenue).[14]

Despite Pareto's claims, the substitution of monopolistic assumptions for free competition deprives us, without compensation, of the set of equations defining the level of the firms' profits. These profits were assumed, through free entry, to be nil in the competitive case; the substitution of monopoly for competition means the substitution of a whole range of possibilities as to profit for the more precise assumption implied in free entry. In both cases, analytical reasoning is powerless to determine the level of profit *opportunities*. All it can do is to determine the actual amount of profits (at the maximization point), once these opportunities have been empirically ascertained for the concrete case at hand.[15] The case of free

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[12] *Manuel*, pp. 336, 613–617.

[13] *Manuel*, pp. 662–664.

[14] The problem itself — of the distribution of production as between the firms in the industry — appears pointless when the concept of industry is dropped from our construction of value theory. In its relevant form, *i.e.*, the level of output of the individual firm, the question is solved by the equations (I) of profit maximization, or equality of marginal cost and revenue, and this is true for all types of market situations, no matter whether competitive or monopolistic.

[15] In graphical terms, the *profit opportunities* are expressed by the relative position of the cost and sales curves. This is taken as a datum from which the analysis proceeds toward determining the level of output and the profits actually realized by the firm. Under free entry, it is assumed, but not deduced, that in the long run the two curves can only be tangent to one another, leaving no room for "supernormal" profits. Closed entry (associated by Pareto with monopoly) admits all kinds of possibilities in this respect; the actual profit op-

entry (*i.e.*, the assumption that, in the long run, no opportunities of supernormal profits can survive) is only a limiting case, at the lower end of the scale.

C. CHAMBERLIN: THE ENTRY THEORY OF PROFIT

That these profits depend on the concrete circumstances of each individual case is made very clear in Professor Chamberlin's theory of profit. "In so far as profits are higher than the general competitive level in the field as a whole or in any portion of it, new competitors will, *if possible*, invade the field and reduce them. If this were always possible . . . the curves would always be tangent and monopoly profits would be eliminated. In fact it is only partially possible. As a result, some (or all) of the curves may lie at various distances to the right of the point of tangency [between average cost and revenue], leaving monopoly profits scattered throughout the group — and throughout the price system." [10]

Thus, profits are linked with obstacles to entry, and obstacles to entry are recognized to be an institutional datum, incapable of determination through deductive theorizing. With this general view of the matter, I am in complete agreement. There are nevertheless a number of points on which the original profit theory of Professor Chamberlin stands in need of substantial readjustments.

First of all, there is the old connection between entry and the group concept. When the latter is forsaken, it becomes necessary to reinterpret the notion of freedom of entry in terms of firms alone, to the exclusion of "groups," "industries," or "fields." Professor Chamberlin himself has recently proposed such a reinterpretation. "The upshot of the matter seems to be that the concept [of freedom of entry] is not very useful and may even be misleading in connection with monopolistic competition. It is, in reality, a concept usually related to a market for a definite commodity, and the fundamental

portunities of any given firm have then to be investigated through a factual study of its own individual situation. Such a study must also *precede* the assertion of free entry, if this is to be more than an arbitrary assumption.

[10] Chamberlin, p. 113.

difficulty is that there is no such commodity under monopolistic competition beyond that produced by an individual firm. In the matter of entry, all that we need to say is that wherever there are profit possibilities they will be exploited so far as possible. The enjoyment of large profits by any particular firm is evidently an indication that others, by producing close substitutes, may be able to compete some of them away. The results may be very simply described without any concept of freedom or restriction of entry — without even the concept of an 'industry': some firms in the economic system earn no profits in excess of the minimum counted as a cost, others earn more than this, and in various degrees." [17]

This change of view, however, has damaging consequences for the condition of "no-profit" usually associated with free entry. Under heterogeneous competition, the profits of firm i are only a very distant indication of the profit opportunities open to new competitors j. The fact that i is at the no-profit point will no longer prevent the emergence of new competitors; the position of i may deteriorate even further and additional entries may go on, irrespective of the losses made by i. The no-profit point will be nothing more than a passing instant in this process of deterioration of i's position.

When entry is not perfectly free, Professor Chamberlin considers that the various firms may enjoy some monopoly profits. What is the nature of these profits and to whom do they accrue? They do not accrue to the entrepreneur as such. The proof of it is that if the firm is sold or leased, the level of its profits will be taken into account in fixing the price, so that the new entrepreneur will not be expected to get more than his competitive remuneration. The famous economic process of imputation applies without exception and levels out, under static assumptions, any "surplus" no matter whether the entrepreneur be a monopolist or not.

Such a reasoning is at the bottom of Professor Schumpeter's distinction between *monopoly profit* and *monopoly revenue*.

○ [17] E. H. Chamberlin, "Monopolistic or Imperfect Competition?" *Quarterly Journal of Economics*, LI (1937), 567–568.

"Let us now assume that the new combination consists in establishing a permanent monopoly, perhaps in forming a trust which need fear absolutely no competing outsiders. Then profit is obviously to be considered simply as permanent monopoly revenue and monopoly revenue simply as profit. And yet two quite different economic phenomena exist. The carrying out of the monopolistic organisation is an entrepreneurial act and its 'product' is expressed in profit. Once it is running smoothly the concern in this case goes on earning a surplus, which henceforth, however, must be imputed to those natural or social forces upon which the monopoly position rests — it has become a monopoly revenue. Profit from founding a business and permanent return are distinguished in practice; the former is the value of the monopoly, the latter is just the return from the monopoly condition." [18]

Under monopoly as under competition, under closed as under free entry, the producer [19] as such is making neither profits nor losses. Even in the static state there is a monopoly revenue, but this revenue is not imputed to the producer, in his rôle of profit maximizing agent. It is a static income, in no way different, and often undistinguishable, from other factorial costs: rent of the land, buildings and equipment, wages of labor, etc.

The very universality of this no-profit conclusion points at once to its lack of the social implications usually read into it. The producer as such is making no profits, but there may exist, scattered throughout the economic system, monopoly revenues which are not more innocuous for being more stable, and for being paid as rents to the owners of the monopolistic factors, rather than remaining in the hands of the producers themselves.

D. SCHUMPETER: THE DYNAMIC THEORY OF PROFIT

At the starting point of his theory of profit Professor Schumpeter contends that in the circular flow of economic life

[18] J. A. Schumpeter, *The Theory of Economic Development*, translated from the German by Redvers Opie (Harvard University Press, 1934), p. 152.

[19] In what follows, I use the term "producer" to designate the entrepreneur in the general sense of the term, *i.e.*, both the *manager* and the *entrepreneur* of Schumpeter's analysis.

there is no room for any "profit" (or interest), that would constitute "any surplus of receipts over outlays, any excess of the value of the product over the value of the services of labor and land embodied in it. The value of the original means of production must attach itself with the faithfulness of a shadow to the value of the product, and could not allow the slightest permanent gap between the two to exist." [20]

The two forces that must inescapably bring this result about are "competition on the one hand and imputation on the other." [21]

When speaking, in his first chapter, of the absence of profit in the circular flow, Professor Schumpeter insists mainly on the imputation argument. When explaining, in his fifth chapter, the washing away of the temporary profit of innovation, the emphasis passes from imputation to entry and competition.[22] A clearer distinction between these two sets of influences is necessary for a correct understanding of profit, and of its social significance.

The influence of imputation only ensures the absence of any "gap" or "surplus" in the chain of interdependent valuation of all goods and services. As soon as producers realize a permanent profit, "they must value correspondingly the means of production to which they owe it." [23] The process is absolutely general, but leaves room for all kinds of "monopoly revenues," or "gains of position." [24]

To be ethically or socially significant, the "no-profit" assertion must refer to the washing away of monopoly revenues and gains of position, as well as of dynamic, entrepreneurial profit. For this, however, more than sheer imputation is necessary: we must appeal to the entry of additional producers and rivals, competing away the monopoly revenues, and forcing

[20] J. A. Schumpeter, *The Theory of Economic Development*, p. 160.

[21] *Ibid.*

[22] *Ibid.*, pp. 131–132.

[23] *Ibid.*, p. 31.

[24] Cf. R. A. Gordon, "Enterprise, Profits, and the Modern Corporation," in *Explorations in Economics, Notes and Essays Contributed in Honor of F. W. Taussig* (New York, 1937), pp. 306–316.

down the rewards of all productive agents to the competitive level. This takes us back to the problem of entry. We have already seen that free entry — an important and integral part of the classical theory of free competition — describes only one out of many possibilities. Other, more limited, opportunities as to entry are powerless to bring about the elimination of all gains of position. In these cases, the "profitless" character of the circular flow springs only from imputation and expresses, not the absence of monopoly revenues, but merely the fact that they do not accrue indefinitely to the entrepreneur as such. Again, deductive theorizing is in no position either to justify or to condemn the workings of our individualistic economic system.

E. PROFITS AND HETEROGENEOUS COMPETITION

1. *The Remuneration of the Producer*

An important aspect of the problem of profit is that the remuneration of "producing" activity (meaning the profit-maximizing activity of managers or heads of businesses) is, just as any other productive service, determined by the general rules of interdependent pricing.

As far as the remunerations of individuals are concerned, the problem is simple enough. If we ignore such questions as the length of the working day (often fixed independently today by the institutional environment) and the differences of attractiveness as between different types of work, each individual seeks to maximize his monetary income from any type of activity open to him. If this activity can be spread over various occupations, he will divide his time among them so as to equalize marginal returns $\dfrac{\delta w_1}{\delta t_1} = \dfrac{\delta w_2}{\delta t_2} = \cdots \geqq \dfrac{\delta w_k}{\delta t_k}$ (w_1, w_2, etc. representing the revenue derived from, and t_1, t_2, etc. the time given to, the various occupations 1, 2, etc. in which he is simultaneously engaged; w_k, t_k refer to any other occupation, not engaged in by our producer). For the sake of simplicity, we assume that such divisibility is excluded and that his whole activity is devoted to a single firm. If the resulting reward is

smaller than the prospects offered by a different occupation (whether as a "producer" or not) actually open to him as an alternative, he will shift to the latter occupation.

In this way the theory of general equilibrium forms a bridge between the remuneration of all producers, and even between the remuneration of the producer and the remuneration of any laborer, or employee. Some qualifications, however, must be kept in mind.

First of all, every individual is more or less specialized in one type of activity: in the short run, the mobility between various occupations is very slight, and an element (positive or negative) of quasi-rent appears in every kind of remuneration. Even in the long run, the mobility between various classes (in the sense envisaged by economic theory) is largely illusory: in practice, the obstacles to a "transfer" from manual labor to directing activities may be high and, in many cases, prohibitive. In the same measure and degree, the levels of remuneration in the corresponding types of activity are cut off from one another.[25]

A second qualification concerns more exclusively the remuneration of the producer: it is the non-contractual, residual, uncertain character of his income.

If the producer's remuneration was perfectly stable and certain, its residual, non-contractual character would be of little importance. And so it is in the static economy of the circular flow. In a changing, dynamic economy, the *uncertainty* resulting from the residual determination of the producer's income becomes relevant, as it must now be taken into account in the income-maximizing calculations of the individual. When choosing between different possible occupations, he has to compare remunerations of different degrees of fixity and stability.

Much of this uncertainty is also borne in fact, even if not

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[25] In capitalistic society, ownership of a factor of production gives a title to remuneration, just as well as the ownership of one's own labor force. The distribution of ownership, however, and thus the choice of corresponding activities, escapes the *economic* mobility described above almost entirely. The distribution of ownership depends on "all the historical and economic contingencies in which the evolution of society has taken place." *Manuel*, p. 363 (translation mine).

always legally, by capitalistic owners as much and perhaps more than by propertyless producers. Indeed, the pure, propertyless entrepreneur has little to risk.

The real relevance of change and uncertainty for a theory of profit is in the loosening of the actual link between productivity and remuneration. In a changing world, it cannot be said of profit, as of the elements of cost in the circular flow, "that it just suffices to call forth precisely the 'quantity of entrepreneurial services required.' Such a quantity, theoretically determinable, does not exist. And the total amount of profit actually obtained in a given time, as well as the profit realised by an individual entrepreneur, may be much greater than that necessary to call forth the entrepreneurial services which were actually operative. . . . It is . . . clear that the connection between quality of service and private success is here much weaker than for example in the market for professional labor." [26]

It is precisely this difference that justifies the distinction between the circular flow, entirely dominated by equilibrium economics, and innovations (*i.e.*, changes accompanied by uncertainty) [27] introducing "surpluses" and "gaps" in the equilibrium system of remunerations and relationships. [28]

2. *Innovation*

The producer "innovates," or becomes an "entrepreneur" in the Schumpeterian sense, when he no longer takes the cost and sales curves as given, but directs his activity toward shifting these curves, and so changes himself the conditions under which profit maximization is achieved. As the influence of the pro-

[26] J. A. Schumpeter, *The Theory of Economic Development*, pp. 154–155.

[27] *Ibid.*, pp. 63–64. Entrepreneurial profits might be considered as the price for accepting the burden of uncertainty. But it must be remembered that the burden is often borne by absentee owners and that the "price" is hardly related to the cost.

[28] If the economic value of our invention could be perfectly clear and calculable from the start, the inventor himself could exact its real worth, and there would be no room left for an innovator to come in and make a profit. Innovation consists in carrying through the invention, in proving its worth by putting it into actual practice. It may be dispensed with, if the economic potentialities of the invention are self evident. This point was brought to my attention in a discussion with Professor W. Leontief.

ducer upon prices of factors and of product is already taken account of in the cost and sales curves, this implies a change either in the production function or in the type of product.

The choice of a definite type of product depends on the appreciation by the producer of the pattern of the consumers' tastes for various commodities. When the producer modifies his views about the pattern of these tastes, or when he considers the possibility of changing consumers' tastes by his own activity,[29] he may find it profitable to change the type of commodity produced, shifting in this way both the sales curve and, in all likelihood, the production function of the firm. In fact, the firm's identity really changes when these ultimate elements on which profit maximization proceeds are changed, and it is better to say that a new firm has been created.

This is also the case when the change originates, not on the demand side, but on the cost side through a change in the production function. It is here necessary to make more precise our definition of the production function. First of all, nobody would include in the production function technical methods not yet discovered today, but which might become available as a result of scientific and technological progress. A second concept must also be discarded: the production function should not be viewed as a general catalogue of all methods available today to a man accurately informed of every scientific and technical development. A process patented by another firm, a discovery known only to some Crusoe, isolated in his island, or even a production method known and used by a thousand competitors, but which still escapes the attention of the particular producer, all these do not enter the production function of the producer

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[29] For our purpose, this might better be reduced to the first case, by considering advertisement and other devices calculated to change the tastes of the consumers, as a modification in the type of product sold. Then, the realization by the producer of the possibility of changing the consumers' tastes becomes simply a case of a realization of consumers' tastes for potential products; thus sales promotion, advertisement, etc. . . . . are considered as qualifying the nature of the product or, if one prefers, as being another product sold to the consumer and enhancing the sales of the advertised product sold jointly with it. Cf. F. H. Knight, *Risk, Uncertainty and Profit* (Boston, 1921), p. 339; and Chamberlin, Chapter VI, especially p. 126, n. 1.

under consideration. The production function does not incorporate objective, general, abstract possibilities, but only those concrete and relevant possibilities facing a given producer at a given moment of time. There is no production function of an *industry*, but only the individualized production function of the *producer*, and this depends on his direct knowledge, as well as on his indirect knowledge, *i.e.*, the knowledge put at his service by his engineers and technicians.[30] Any change in this production function should be considered an innovation, no matter whether the change is really a pioneering one, implying qualities of leadership, or whether it is only a tardy imitation of what a thousand producers have long put into practice.

In general, let us remark, changing the type of product and changing the production function cannot be isolated completely from one another. Innovation on one side is generally accompanied, of necessity, by some change also on the other side. The two will not be distinguished any longer, but will be discussed together as constituting "one" innovation. Only the total effect of this double change on profit will be relevant for the innovator's calculations and decisions.

When entrepreneurship is so defined, it becomes increasingly clear that every producer must be expected to display, at least at times, some degree of entrepreneurship. Every producer, if he is to attain any measure of success, cannot be a sheer "manager."

Each innovation modifies the level of profit opportunities attached to a firm or rather creates a new firm, provided with profit opportunities of its own. At first, we should expect no innovation to be launched that was not designed to increase, rather than decrease, the level of profit. The results, however, may fail to confirm the expectations; moreover, some changes in the knowledge of the producer, and thus in his production function, may be absolutely unwanted but unescapable (*c.g.*, a change in his "indirect knowledge," owing to the death and

[30] We can speak of an industry's production function only after we have assumed that the firms composing it are absolutely alike with respect to product and to methods of production. The assumption is implicit in some of the traditional expositions of competition.

replacement of a peculiarly able engineer). In this way, innovations may very well be detrimental to the firm. In the majority of cases, however, it remains that innovations are made to raise or create profit opportunities. The new firm will, in general, present better opportunities than the old one of which it takes the place. This may be linked, not only with greater efficiency in production, or with higher quality of product, but just as well with the achievement of a stronger monopolistic position, affording a larger degree of price control. No value judgment need be associated with the concept of innovation.

The whole theory has been handicapped so far because it attempted to kill two birds with one stone: (1) The study of the profit maximizing activity of the firm introduces as a datum the production function under which the cost curve is derived. In this connection, the production function can only be defined with reference to the individual firm, and any change in it, whether a pioneering one or not, is an innovation, in so far as it modifies the level of profit opportunities of that particular concern. (2) If the change is a pioneering one, a monopolistic situation may result, making the firm much more profitable than the other firms around. The inventor, however, will be in a position to exact from the innovating firm a reward which will be the larger, as there is less uncertainty in the practical, economic worth of the invention.

While the second concept is more important for a broad, sociological theory of economic progress, the first one is more in keeping with the traditional structure of economic theory and with its analysis of the equilibrium of the firm. It is also indispensable to describe in detail the path followed in any process of change. The pioneering innovation confers monopolistic gains to the first firms that apply it. As more and more firms follow suit, the monopolistic gains are reduced and may eventually be completely eliminated. On the other hand, each one of these innovations, or changes, takes some purchasing power away from the markets of the other firms in the economy.

There ensues a continuous process of deterioration in the position of these firms. The only way in which they can rescue themselves from this downward spiral is to escape also from their routine and to push their own level of profit opportunities upward again, through innovations of their own, no matter whether pioneering, or merely imitative.

3. *The Imputation of the Profits of Innovation*

As a result of the innovation, the old system of relationships within the firm may be deeply modified and a "surplus" appear between revenue and cost. To whom will this surplus accrue?

First of all, it is clear that someone must get it and that this someone is not necessarily the producer-innovator, the entrepreneur. The only reason why "profit" should go to the entrepreneur as such, rather than to other people contributing their services (personal or "real") to the firm, is the fact that the producer is generally the residual claimant. As such, his income appears as a kind of shock absorber, taking in the short run all the fluctuations which it spares the factors remunerated according to contracts. But this is all, and at the expiration of the contracts, the usual rules of imputation redistribute the "surplus" between the producer himself and all of the firm's factors.

His special situation (as to knowledge and power) in the firm may, however, enable the producer to profit here from a better bargaining position in the making of these contracts. This may be of importance when situations of bilateral monopoly arise between him and the factors to be hired, owing to the higher efficiency of these factors for a firm in the service of which they are narrowly specialized.[31]

Despite these qualifications, the fact remains that the "sur-

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[31] One street corner may, better than any other, suit the needs of one definite firm; this implies, first, that no other street corner does as well for that firm, and secondly, that no other firm can derive as much benefit from that particular corner. This combination of circumstances gives rise to bilateral monopoly while the first circumstance alone would introduce a monopolistic element in favor of the street corner, and the second alone, a monopsonistic one, in favor of the firm.

plus" soon melts away into increased remunerations to the various elements composing the firm. It may go to the owner of a patent, to the owner of a unique location, to anyone or anything responsible for the better results obtained by the firm. The "profits" thus resolve themselves into "rents" in the Paretian sense, *i.e.*, into increased remunerations of some factors (inelastically supplied), when one position of equilibrium is, in a dynamic world, replaced by a new one.[32] The stability of these rents will then depend upon the possibility of competition from other, more or less similar factors. If this possibility increases greatly with the passage of time, the *Paretian rents* reduce to the *Marshallian quasi-rents*. If the profit results from the creation of a monopolistic situation, protected from entry, it gives birth to what is called a *monopoly revenue* by Professor Schumpeter, and appears on Professor Chamberlin's diagrams as a surplus of revenue over cost. The "profit," however, is not this continuous· income, but its capitalized value. It is acquired, so to speak, overnight, and not in the daily operation of the firm. It accrues not to the entrepreneur as such, but to the owner of the monopolistic shelter, patent, location, etc.

4. *Entry and Rents*

In the measure in which entry is closed, these rents — the heirs of the original profits of innovation — constitute a stable revenue. They benefit the owners of those factors which, in the case at hand, close the entry and protect the privileged situation of the firm.

Often, however, the innovation is more or less rapidly followed by a similar activity on the part of other producers, in competition with the first. The rents are thereby reduced through the lowering of selling prices on the one hand and, on the other, through the increased production of the factors upon which a short-run inelasticity of supply had conferred a higher valuation.

Under pure and free competition of the traditional type, the

[32] *Manuel*, pp. 337–342, and *Cours*, passim.

problem is simple enough. An entrepreneurial innovation creates
a new firm which, for a time, is the only seller of a new type
of product. Soon, however, homogeneous competitors appear,
depressing the price of the product, making its demand curve
more and more elastic, and raising for all the producers the
prices of their factors.

We picture the two terms of such a process in Figures Va and
Vb. Output being measured in abscissae, CC' and DD' repre-
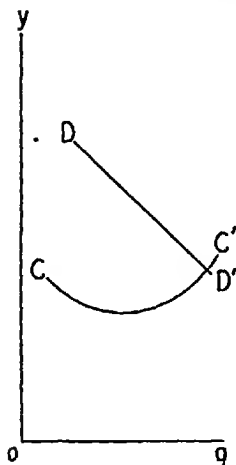
The Monopolist
Innovator

FIGURE Va
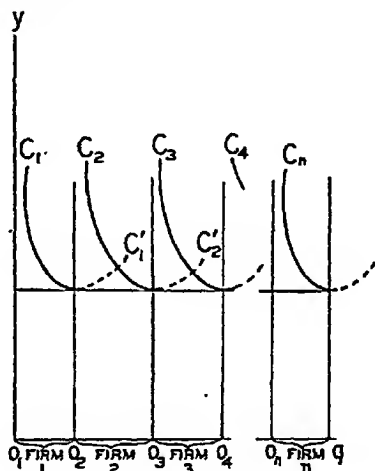
The Free Competitors

FIGURE Vb

sent respectively the average cost and revenue curves of the
firm. It is supposed throughout (entry being assumed per-
fectly free) that cost conditions are identical for all the homo-
geneous competitors and that, if costs rise with the expansion
of their total output, they rise for all of them, independently
of their individual levels of production. At every moment in
time, the point of minimum average cost is the same for all

(although perhaps at different outputs). In this case, the "rents" appear in the general increase in factors' prices and in a kind of Paretian consumers' rent: the lowering of the price of the product. The relative shares of the factors' and of the consumers' rents vary with the elasticity of supply of the factors to the group of homogeneous competitors.[33]

If the innovation consisted simply in the reduction of the producing costs for a commodity already sold under pure, free competition, the process could be described even more simply, as the demand curves would be elastic throughout.

When entry is not perfectly free, the various firms start with different initial costs, inherited from the equilibrium relations of the previous circular flow. As the product is still assumed identical, it sells for the same price, and, when the process of imputation will have taken place, the unit costs of all firms will be similarly equalized, being all brought to equality with an identical selling price. The initial cost differences are levelled out by increased remunerations (or Paretian rents) to various cost factors of the firm (including among these costs the producer's competitive reward, the monopoly incomes going to some factors or patent owners, etc.).

Figure VI depicts such an evolution. Firm 1 could have produced, according to the valuations of factors prevailing in the preceding "circular flow," at a cost O_1M, firm 2 at a cost O_1N, etc. The market demand being now such as to absorb the amount O_1E at a price O_1S, costs will climb, in the new equilibrium situation, to O_1S for all the firms; the original differences in costs will be levelled out by a revaluation of the cost factors (not necessarily the same for all the firms) according to their new efficiency. If firm 1 could produce at a lower cost than firm 2, there must exist between the services used in production by the two, differences in efficiency which, when contracts are renewed, will be taken into account.

This explains also, in a more concrete manner, the content

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[33] The "group" having, in the case of homogeneity, a definite, if *a posteriori*, meaning.

of the concept of entry. For entry to be perfectly free, it is not enough that new competitors be able to produce a commodity economically homogeneous with the one considered. They must, in addition, be able to produce it at the same cost
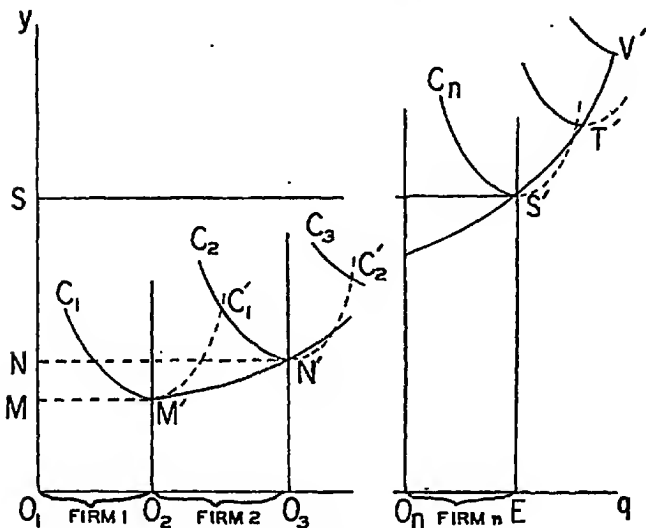
FIGURE VI

as the firms already in business. Freedom of entry, under homogeneous competition, is expressed by the slope of the curve $S'T'V'$ . . . connecting the minimum cost points of the marginal producer and of the potential competitors with the lowest costs. Under perfect freedom of entry the curve will be horizontal. (Fig. V, p. 174.) In the Robinsonian case of closed entry, it would be vertical, indicating the impossibility for any new competitor to produce at any cost.

The readers will have recognized in the curve $M'S'$ . . . the famous "particular expenses curve" of Marshall.[34] The

[34] Marshall, p. 810 and n. 2.

"original" values it indicates depend on the relationships current in a preceding equilibrium situation. The dynamic change introduced by the innovation leads, in the succeeding "circular flow," to a revaluation which levels out (on the curve SS') the costs of all *actual* producers.

The situation is more complex when heterogeneous competition is considered. A new coordinate appears in the definition of free and closed entry: not only costs, but also the degree of competitiveness may vary among the rival products and firms. For entry to be perfectly free, competition should be homogeneous; for it to be perfectly closed, all competition (heterogeneous as well as homogeneous) should be excluded. Reality falls in between these two extreme, limiting cases. Again, we are faced with the problem of detecting, in each concrete case, what conditions prevail as to entry. The question is a question of fact, not a part of our deductive theorizing.

5. *The Direction of Production*

The diagrams we have just drawn refer both to actual firms and to potential enterprises not actually in business. On Figure VI, the diagram comprises two distinct parts, separated by the vertical ES'. On the left of ES' are pictured actual producers whose cost curves, in the new position of equilibrium, are no longer the ones indicated, but should be drawn as tangent to the horizontal SS'. On the right of ES', are pictured potential competitors who do not, in fact, appear on the market; if they did, all their factors could not be paid at the value reflected by the cost curves pictured on the diagram, and the total payments to factors would have to be reduced to the level of the firm's total revenue. The cost curves T', V', etc., result from the market values of the factors as determined by better alternative opportunities for employment. They also indicate that the factors will be drawn toward these other employments rather than toward the one to which the diagram refers.

Factors are directed toward the most profitable employment

opportunities open to them, and their employment by a firm depends on the possibility for that firm to bid them away from other channels of employment. Once "immobilized" in a given employment, however, the factors may prove (owing to miscalculations or changes in the external environment and in the competition of other firms) to be less remunerative than had been expected. Losses will have to be taken, since the actual receipts limit the total of possible outlays. These losses will, in the short run, be distributed according to existing contracts. The residual claimant bears a higher degree of uncertainty, but every bondholder knows also that legal fictions and contracts are no perfect shelter against the ultimate insolvency of their debtor. In a changing world, any income claimant is the subject of risk and uncertainty: any laborer may fail to receive his wages, any landlord his rent, if, *e.g.*, the debtor runs into bankruptcy. In a longer run, the losses will be taken in the form of negative Paretian rents, by the owners of the factors concerned.

Again, this revaluation of factors at lower levels will be more or less final, depending on the possibility of transferring them toward other employments, just as the stability of a revaluation at higher levels depends on the difficulties of competition and replacement by other factors.

Finally, the replacement should be judged in terms of market demand and may involve substitutability of products as well as substitutability of factors.[35]

Thus, economic evolution, through innovations or through external changes in data, entails a continuous revision of values, and a consequent revision in the employment of economic resources. Creations and disappearances of firms (or transformations of one firm into another) are one of the aspects of this process of change. Ultimate responsibility is inseparable from ownership, but contractual agreements may shift it in part, especially in the short run, toward residual claimants in the

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[35] Cf. F. Machlup, "The Common Sense of the Elasticity of Substitution," *Review of Economic Studies*, II (1935), 202–213.

firm's receipts. The association of this responsibility with the actual control over the firm was one of the pillars of the individualistic organization of production at its zenith. It dominates the economic theory of profit to this very day. Even though it is recognized in passing that "the entrepreneur can be relatively . . . easily deprived of his profit," [30] Professor Schumpeter's *Theory of Economic Development* still suggests to many readers that the entrepreneur is the "normal" beneficiary of the profits resulting from his innovations. I would prefer to say that, although all profits of innovation accrue finally to ownership, and not to management, it is normally to be expected that the entrepreneur will do his best to put himself into such a position that he can reap as much as is possible of the profits that he expects to result from his innovation. He will try to entrench himself either through outright purchase or through long term contracts giving him control of the factors to which Paretian rents will accrue.

2. An Institutional Income

We have already seen, in the preceding pages, that profit, in the traditional sense of the term, dissipates itself among a number of different claimants. The distribution of profit among the entrepreneur and the owners varies in each case with the institutional setup governing their mutual relationships and under which production is taking place.

That traditional theory largely ignored this institutional character of profit may be ascribed to three essential aspects of classical thought.

Economic theory began its analysis of profit in times when, for the most part, entrepreneurship and ownership were not separate and it still likes to put upon the producer all the burden of responsibility, uncertainty and decisions, as well as all the financial consequences (profits or losses) of his policies. Indeed, if ownership has been finally divorced from entrepreneurship, it is, in general, only the financial ownership of the capital invested in the enterprise. The producer is still viewed

[30] J. A. Schumpeter, *The Theory of Economic Development*, p. 155.

as the owner of most of the factors to which Paretian rents may accrue: buildings, equipment, patents, etc. even though he owns them with money borrowed from capitalists, to whom an interest is paid and who cannot escape some uncertainty as to the repayment of their loans. The "owner" of current profit theories is a pure owner, who has abandoned to the entrepreneur all his rights of control, in exchange for a fixed yearly income, sheltered from hazards and fluctuations. But the "real" factors of production are still, in part, the property of the entrepreneur. In order to separate ownership and entrepreneurship completely, we must extend to the ownership of the concrete factors the separation effected so far for the financial ownership.

Secondly, the classicists based their analysis on the concept of a perfect market, in which the value of the factors is independent of the actions of any one individual. Even if the entrepreneur does not own the real factors of production, as for instance, labor, he will not be deterred from a socially desirable course of action, by the thought that his innovation will merely go to enhance the value of factors owned by others, and, in this way, increase his outlays rather than his profits. The value of the factors is determined by the market at large and his individual influence over their prices is practically nil.

Finally, the classical theory, when presented in a strict logical form, is predominantly static, unconcerned with innovations and new developments. Under such conditions the whole structure of modern profit theory becomes irrelevant, and no difficulty is raised by the idea that the entrepreneurs, faced with purely competitive markets and traditional unchanging technologies, can survive only through a constant strife for profit maximization. Indeed, the *homo oeconomicus* of our textbooks ceases, under such circumstances, to be a mere methodological assumption. It becomes the product of the system, the ineluctable result of competitive capitalism.[37] At this point, economic theory verges upon sociology and the passage from

[37] Cf. Sombart's article on "Capitalism," in the *Encyclopaedia of the Social Sciences*, Vol. III, pp. 195–208.

pure to monopolistic competition acquires a deeper significance for the analysis of capitalistic institutions.

In the more restricted field of profit theory, monopolistic competition and dynamic change force us to give due attention to the institutional setup of production, *i.e.*, to the various possible relationships between ownership and control. Before considering the mixed cases of real life, it will be illuminating to isolate first the two limiting cases conceivable: complete fusion of enterprise and ownership, and total separation of the two.

A. THE ENTREPRENEUR-OWNER

Thus, we first assume that the producer concentrates in his own hands control over the firm and actual ownership of all its factors. In such a case, the producer controls all decisions to be taken, and bears all the results of this control. If, through innovations or otherwise, the cost and sales curves of his firm are shifted, it is the factors he himself owns that will be affected by the consequent revaluation: Paretian rents (Marshallian quasi-rents, Schumpeterian monopoly revenues, etc.), positive or negative, modify the yield and the valuation of the owner-entrepreneur's property. Every one of the many profit theories (uncertainty, innovation, differential managerial wages, risk theories of profit, etc.) describe correctly the general workings of such a situation, since the theoretical distinction between property and entrepreneurship is, in this case, of little practical interest.

The assumptions implied, however, are extremely drastic. The abolition of slavery makes it impossible for the entrepreneur, if the firm requires the employment of outside help, to *own* all the factors used. Workers and employees suffer from, and profit by, his managerial and entrepreneurial policies. A relatively high degree of transferability of labor from one enterprise to another limits, however, the influence of a single producer upon the value of the labor he employs.

Let us remark that this owner-entrepreneur may very well put a director in charge to whom wages will be paid; this director will even be expected to show some degree of entre-

preneurship (in the broad sense defined above). More than that, if a man offers to direct the firm and to introduce into it a leading innovation, thereby greatly enhancing the value of the firm, the owner will pay him a higher salary, corresponding to his greater services. What is important for us is this: as long as the owner retains the control of the firm in his hands, paying a salary to his director and keeping the right to dismiss him at will, ownership and control remain united in him. The producer is not the employee; but the owner; it is really he who tries to maximize profits, through a judicious choice of his directors, just as a propertyless producer maximizes profit through a judicious choice of his engineers and employees, and of the "inventors" he may eventually hire in order to make an "innovation." Despite the appearances, the maximizing function is not separated from the function of ownership.

B. THE PROPERTYLESS ENTREPRENEUR

At the other extreme, let us try to imagine the relationships between a propertyless entrepreneur, on the one hand, and, on the other, pure owners escaping all responsibilities as to decisions and as to their results. Such a dissociation of ownership from control is not congenial to our minds, accustomed as we are to the totalitarian organization of property achieved by the French Revolution. It is, however, constantly sought after by profit theorists and should be systematically attempted if we are to get a clear view of the respective role of personal services and of pure, passive ownership in modern enterprise. Only then shall we be able to distinguish between these ultimate components of any profit theory: pure entrepreneurial profit, personal wages for producing activity and income on property (certain or uncertain).

To do this in a simple way, let us imagine that our entrepreneur-owner of the preceding pages wants to go on a long trip around the world and to forget business for the time of his absence. He might decide to hire out his firm (property included), leaving all control and responsibility in the hands of an active producer whom he allows to run the firm on his own

account. The contract, if there is competition between the "candidates-producers" will normally be drawn in such a way as to reduce the residual remuneration of the leaseholder to the market reward for "producing" activity.

At this point, a time element enters the analysis, there being no other way of isolating pure, passive, ownership from producing activity. The contracts must be supposed to leave the factors under the control of the propertyless producer for some period of time. For the length of the contract, the return on innovation will benefit the producer-entrepreneur. At the expiration of the contract, it will go to increase the rents of the factors owned by the travelling owner. Therefore, since the future value of these rents is seen by the owner to depend on the degree of entrepreneurship of his producer, we conclude that, when fixing the terms of the contract, the owner will find it to his own interest to give better terms to an active producer, likely to introduce innovations, than he would to a less imaginative producer who is expected to stay closer to routine. This, however, merely goes to show that "producer's wages" are differential, dependent on the efficiency of the producer, not only as an administrative manager, but also as an entrepreneur.

C. THE MIXED CASES

Between these two limiting setups, a whole set of intermediary types are conceivable. The sum paid by the producer to the absentee owner may be made proportional to profits, to output,[38] etc. rather than be a fixed, yearly, rent calculated in money. Mixed types, more or less comparable to "métayage," make it impossible entirely to isolate ownership from producing activity. The pure owner type has no actual control over the firm's activity and receives an income contractually fixed —

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[38] An important point, often overlooked by "ideal output" theorists, is the fact that these stipulations may affect considerably the level of the equilibrium output of the firm. The analysis of this influence would parallel closely the Marshallian theory of taxation. Cf. *Principles*, pp. 480–483, and Note XXIII of the Mathematical Appendix, p. 856; cp. Cournot, Chapter VI, pp. 67–78 and Chapter VIII, pp. 92–98. The same must be recognized of the stipulations about the hiring of isolated factors; the output, *e.g.*, will be different depending whether a mining royalty varies or not with the amount extracted.

although not entirely exempt from risk and uncertainty. The pure producer operates and controls the firm, and receives an income directly dependent upon the success of his producing activity. At the times of expiration and renewal of contracts, the pure owner resumes for a short spell his full property rights and, in his choice of a producer, tries to maximize his future income from the ownership of the firm, *i.e.*, he tries to maximize the rents to be paid during the length of the next contract, plus the expected value of the factors at its expiration.

If the owner always keeps the right of dismissal at will, the man he puts in charge should not be considered a producer in the full sense, even though his remuneration may be truly residual. The owner, in this case, is not purely passive, but retains, in fact, a large element of control and of maximizing activity.[39] Such a setup would provide little incentive for entrepreneurship by the person in charge: any innovation he would introduce would benefit the owner, by allowing him to exact a higher "consideration" for renting the factors.[40] Under such an arrangement, therefore, a large part of the producing and innovating activity should be regarded as still residing in the owner himself. I think that this is the institutional situation mostly envisaged in Professor Knight's "uncertainty theory" of profit.

Many actual cases are of such mixed types: the producer is neither a pure, propertyless entrepreneur, nor a full owner of all the factors used by the firm. Here also, as for pure monopoly and competition, and for closed and free entry, the pure cases are in the nature of limits rather than of representative descriptions.

D. CONTROL AND RESPONSIBILITY — THE MODERN CORPORATION

Of the various types described, only the first one fits perfectly all the presuppositions of traditional economic theory,

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[39] The fact that this maximizing activity is "indirect" is not specially relevant. Most maximizing activity is of this character.

[40] It benefits the man in charge of the firm, in so far as it increases his recognized market value as a producer and innovator, and so increases his wages, residual or contractual.

in which industrial incentive is based on the pecuniary responsibility of each agent for his own decisions and activity. In the measure in which control over the firm is separated from the ownership of its factors (including monopolistic shelters as factors), the Paretian rents, positive or negative, accrue to the owners, and not to the producer. When the latter introduces an innovation, the resulting profits benefit the owners, except in so far as he has ensured his own position through long term contracts; similarly, it is the absentee owner that bears, in the form of negative Paretian rents, part of the burden of the producer's mistakes or negligence, and remains, sometimes, responsible for his ultimate solvency and the fulfilment of his contracts.

This is one of the problems which must be considered today in the legal regulation of corporations, holding companies, etc. Legally, the only pure owners in the corporation are the bondholders; their income is contractually fixed (although, as we have noticed already, they are not devoid of risk and uncertainty) and they have little control over the firm. The shareholders partake of the responsibilities of production: their income is contractually attached to the fortunes of the firm, and they have, at least in theory, a voice in its control. The effectiveness of this control varies immensely with each concrete case: the share of the "producing" activity borne by the shareholder varies in the same way. In addition, the shareholders are also, at least in part, the owners of the firm's "real" factors.

An enterprising producer, intent upon introducing innovations that will greatly enhance the corporation's income, will try: (1) to secure a position of control from which he shall not be easily ousted; (2) to secure for himself an important cut of the expected profits. The corporation laws in different countries give him more or less leeway to achieve these aims through the drafting of the corporation charter.

The efforts, however, of a promoter to secure such a position in the corporation do not at all guarantee his intention or his ability to increase the corporation's profits. His purpose may be sheer exploitation of the bondholders and shareholders. If

the creation of new profit-opportunities is always considered an innovation, he may innovate by creating such profit-opportunities for himself, rather than for the corporation, through influencing the rules according to which the corporation's profits are to be distributed between himself and the other claimants.

It is hardly necessary at this point to refer the reader to the standard work of Berle and Means, *The Modern Corporation and Private Property*.[41] Theoretical economics has, so far, paid little or no attention to those modern excrescences of capitalistic institutions which are altering radically the traditional logic of property rights: the increasing divorce between control and ownership, the scattering of one individual's interests and influence over a number of firms, the conflicts of interests between irresponsible managers and absentee owners, etc. Pure theory has often relied too blindly on the formula that "each firm tries to maximize its profits." The traditional analysis of the firm depends, for its validity, on this methodological postulate. In fact, however, the firm is a mere abstraction: profit maximization is the concern, not of the legal entities called firms, but of human beings. Pure theory starts on the assumption that each man tries to *maximize his income*.[42] When, as was the case under the traditional owner-management setup, the interests of the individual coincide with the interests of a business enterprise, it is convenient to adopt a short cut, and to speak of *profit maximization by the firm*. With the modern corporation, however, conflicts of interests may multiply between the enterprise and the individuals who control it, and we may be forced to return to the efforts of individuals, within the corporation, at maximizing their own private incomes. This would allow economic theory to look at holding companies, interlocking directorates, etc. not as *curiosa*, outside the grip of theoretical analysis, but as important institutional setups, side by side with the more traditional case of owner-control.

This would definitely deprive the theory of profit of its apologetic character. We would be faced with another instance

[41] New York, 1932.
[42] or his ophelimity; cf. *Manuel*, pp. 594-595, and *passim*.

of the ethical neutrality of our legal economic institutions. They may work either way, against as well as for, what we may consider to be socially desirable. The entrepreneur may exploit shareholders or consumers; or he may be exploited by them. If the profits of innovation can be easily diverted from him to the advantage of absentee owners, it is also possible that the owners may be themselves at the mercy of a management whose interests are wholly different from theirs. Similarly, no value judgment need be associated *a priori* with the concept of entrepreneurial innovation. The innovation may be nothing more than the piling up of additional product differentiation ("fancied" as well as "real")[43] upon a harassed consumer, the ruthless exploitation of an inventor, or, more simply a lucky hazard.[44]

The conclusion to be drawn is not that our economic institutions, according to the aspects emphasized and to our ethical criteria, deserve moral approval or indignation "en bloc," but rather that they are perfectly indifferent to the moral and social contents of their workings. This commonplace should not even be worth mentioning, if it were not for the lyrics and the diatribes universally raised around the pure economics of competition and of monopoly.

[43] Chamberlin, p. 56. Additional product differentiation makes room for additional control over price by the producers and for additional "scarcity policies" in production.

[44] J. A. Schumpeter, *Theory of Economic Development*, p. 90, n. 1.

CONCLUSION

BORN and reared in a Marshallian environment, monopolistic competition has been, unto this day, encumbered by the fetters of particular equilibrium methodology. The grouping of firms into industries, and the discussion of value theory within the walls of one isolated industry are perfectly valid and adequate procedures under purely competitive assumptions. They are, however, antiquated and entirely out of place in so far as monopolistic competition is concerned. Product differentiation robs the concept of industry of both its definiteness and its serviceability. Outside of the limiting cases of pure monopoly and pure competition, the substitutability between any two products, the competitiveness between any two firms varies only in degree. The grouping of firms into industries cannot be based on any clear-cut criterion, nor can it be of any help in a general statement of value theory.

With the industry, also goes overboard the treatment of profits in terms of closed and free entry (or, in the old Paretian terminology, monopoly and free competition). Whether or not the creation of new firms can affect the demand curves and profit opportunities of the firms in business is a factual matter, to be ascertained in each individual case. Between the limiting cases of Paretian monopoly (complete protection of profits), and free competition (levelling down of profits to a competitive level), there exist all kinds of concrete situations, irreducible to any standard pattern or simple assumption.

The substitutability between any two products, the vulnerability of any firm to incursions from new rivals, are problems outside the reach of theoretical deduction. It is only within the framework provided by factual, descriptive answers to these questions, that pure theory can display its usefulness. The attempts of each individual at maximizing his income (of each firm at maximizing its profits) take place within the range provided by this institutional environment. When all

elements of oligopoly can be excluded, the range is easily narrowed down to determinate equilibrium points. When oligopolistic influences are at play, the solution becomes dependent on a larger number of circumstances, outside the compass of traditional pure theory.

Classical analysis was able to reach a high degree of simplicity and definiteness, owing to the use of a number of very drastic and limited assumptions: identity of each firm with an individual owner, purely competitive markets, perfectly free entry. As these assumptions are relaxed one after another, the theory gains in generality, loses in definiteness. Monopolistic competition theory is larger but vaguer than pure competition; the consideration of oligopolistic types of behavior, of separation between control and ownership, open additional degrees of freedom. The present stage of pure theory appears undoubtedly very formal, lacking in concrete content and practical significance. As compared with the social philosophy of Smithian economics, the ethical neutrality and barrenness of our conclusions may well be appalling.

Disencumbered, however, of all the limitations and taboos implied in the classical assumptions, the way is now open for the building up of a different type of economics. Instead of drawing its substance from arbitrary assumptions, chosen for their simplicity and unduly extended to the whole field of economic activity, our theory may turn to more pedestrian, but more fruitful methods. It will recognize the richness and variety of all concrete cases, and tackle each problem with due respect for its individual aspects. More advantage will be taken of all relevant factual information, and less reliance will be placed on a mere resort to the passkey of general theoretical assumptions.

We are rightly dissatisfied with the distorted picture of economic life which classical theory has bequeathed us. Subconsciously, however, we keep hoping for some other grand formula that would unravel as simply and elegantly the infinite complexity of our modern world. For economics to progress, it must give up its youthful quest for a philosophers' stone.

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